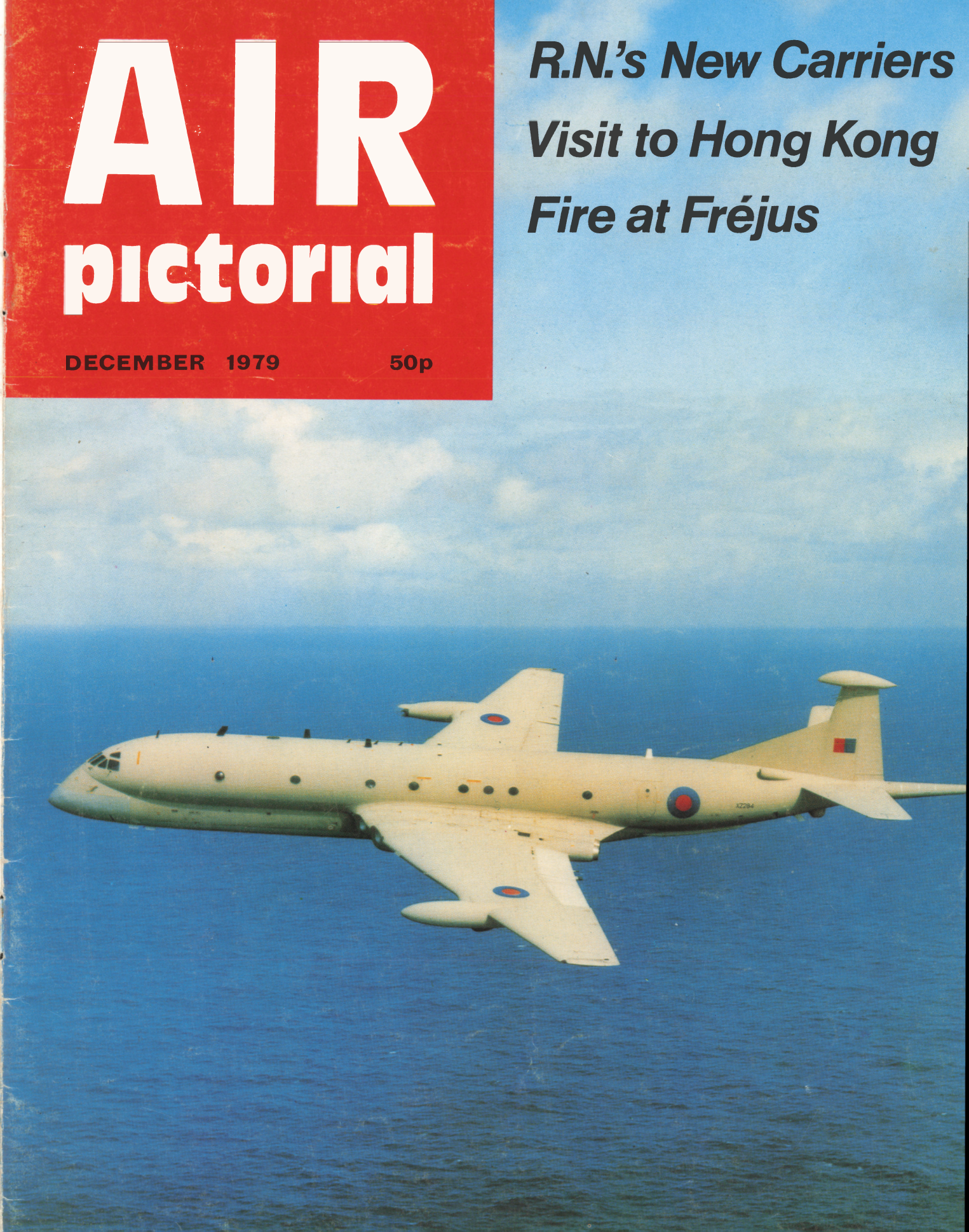
AIR pictorial

DECEMBER 1979 50p

R.N.'s New Carriers

Visit to Hong Kong

Fire at Fréjus



PVA42

'Fundamental to our task'

GENERAL WILLIAM J EVANS, USAF

Tornado, the all-weather strike fighter already in production for three NATO air forces and one navy, meets "a vital need for all-weather interdiction and the ability to operate in hostile air space", said General William J. Evans, then Commander-in-Chief of Allied Air Forces, Central Europe. He said Tornado will provide this capability "which is fundamental to our task".

- Mach 2.2 performance from 3,000ft runways;
- two-crew, two-engine survival ability;
- long range and ultra-low-level penetration in all weathers;
- advanced electronics and small size, minimising chance of detection and vulnerability to counter-measures;
- wide choice of weapons options, including most advanced air-to-surface and air-to-air weapons;
- high-precision, all-weather navigation and weapon delivery;
- over 800 aircraft being produced for air forces of Great Britain, West Germany and Italy and for German navy;
- setting the pattern for full-scale NATO standardisation and inter-operability.

TORNADO

The NATO multi-role combat aircraft

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COVER: British Aerospace's Nimrod MR.2 development aircraft, XZ284, in the new NATO-approved camouflage officially described as "hemp" (Photo: Paul Cullerne)

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AIR pictorial

Cruise Missiles

LATER THIS month representatives of the NATO nations will meet in Brussels to decide on a plan to modernise the Alliance's medium-range nuclear forces. The scheme, which is intended as a counter to Russia's SS-20 IRBM and "Backfire" bomber (neither of which is covered by the U.S.-Soviet Salt 2 discussions), involves basing 464 ground-launched cruise missiles and 108 Pershing 2 ballistic missiles in Europe, suggested countries being Belgium, Britain, Germany, Holland and Italy. Cost of the missiles will be borne by the U.S.A., who has also undertaken to man and operate them.

Although all NATO's European members should be grateful for this latest example of America's generosity, one wonders whether the money and resources could not be better employed. Britain is expected to "host" about 160 of the cruise missiles but constitutes a rather small target—a point made by the R.A.F. when its Thor IRBMs were phased out in 1963. By then it was felt that aircraft, in the shape of the V-bombers, represented a more credible deterrent; later the nuclear deterrent role passed to the Polaris submarines, which posed—and still pose—an even greater threat.

But a key question now relates to the credibility, or effectiveness, of the cruise missile. So far as the current U.S. ones are concerned, they came into prominence when President Carter decided to cancel the Rockwell B-1 strategic bomber (see article in January 1978 issue) and were put forward as a cheaper alternative. To reach the U.S.S.R. from the U.S.A. they would be air-launched from existing types of aircraft. The row arising from that decision does not seem to have died down yet.

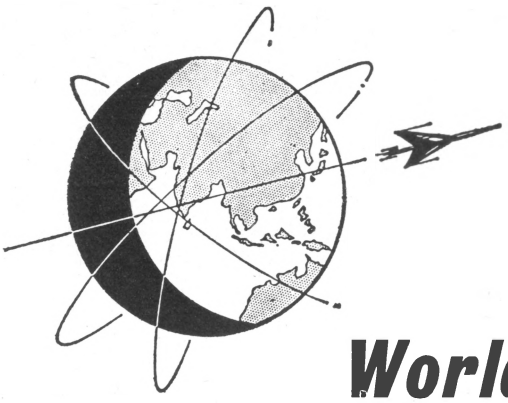
Opponents of the idea do not give much for the chances of the aircrew having to convey the cruise missiles towards their targets—which may be why the present scheme of ground-launching them from nearer bases in Europe seems attractive. But their real objection is the cruise missile itself. Although capable of "ground-hugging", it is subsonic and might not be the most difficult weapon to counter. Some U.S. authorities have likened it to Germany's V-1 "doodle-bug" at a time when the Germans had also developed the then genuinely unstoppable V-2 rocket.

Christmas Greetings to all our Readers

If the Americans have plenty of money to spend on all categories of weapon, then several hundred cruise missiles would be useful as an "extra" to confuse an enemy's defences, but the U.S.A.'s main deterrent threat must still reside in her missile-launching submarines. In this context, it is reassuring to learn that the British Government now proposes to replace the U.K.'s present nuclear deterrent force of four Polaris submarines with a force of five boats equipped to launch Trident missiles. Let no one imagine that 160 cruise missiles would be a valid substitute for that!

PRICE INCREASE

We regret to announce that due to increased costs of all aspects of production, we can no longer hold the price of *Air Pictorial* to the 50p set over two years ago. From January 1980 onwards the price will be 55p.



World Air News

Airbus orders

ORDERS FOR Airbus Industrie's A300 and A310 airliners took a significant jump during the past few weeks, starting with the announcement that Eastern Air Lines, the original "break-through" customer in the U.S.A., had purchased two more A300s.

The two new aircraft, A300B2s, will be delivered early next year and enter service on Eastern's air-shuttle between New York/La Guardia and Boston on 31st January. Eastern have now placed firm orders for twenty-five Airbuses (earlier machines were A300B4s) and have options on a further nine.

British Caledonian Airways have ordered three of the new short-fuselage A310s and placed options on a further three. To be delivered in February, March and April 1984 (optional aircraft would come a year later), the A310s will be used initially on B.CAL's routes to the West African coast, North Africa and on high-volume services within Europe; these services are at present operated by Boeing 707s and BAC One-Elevens.

Martinair Holland, the Dutch supplemental carrier, have ordered three A310-200s with an option on a fourth. Two aircraft will be delivered in 1984 and the third early in 1985. The first A310 will be an all-passenger machine but the remaining two will be convertible types, each capable of carrying 254 passengers or 38 tonnes of cargo. They will replace Martinair's three DC-9s.

SABENA, the Belgian flag-carrier, have ordered three A310s for 1984 delivery and placed options on three more. They will be operated on the airline's European and Middle East routes.

On 30th October Malaysian Airlines System took delivery of the first of four A300B4-200s they have on order and on 16th November it was put into service on the airline's routes from Kuala Lumpur to Hong Kong, Madras, Penang, Jakarta, and Perth, replacing Boeing 707s. MAS expect to take delivery of two more A300s before the end of this month.

On 5th October Messerschmitt-Bölkow-Blohm delivered the hundredth Airbus rear fuselage, which was flown from Hamburg-Finkenwerder to Toulouse in a Super Guppy. It is destined for an A300B4, the fifteenth Airbus for Air France due for delivery next March.

Sales of the A300 now total 186 with options on a further 80. A310 orders now stand at 61 firm plus 62 options, making a total of 389 Airbus aircraft on order or option.

Douglas orders

Japan Air Lines have ordered three more McDonnell Douglas DC-10-40s which will be delivered between December 1980 and March 1981. They will increase JAL's DC-10 fleet to seventeen; nine are already in service and five more ordered in October 1978 are due to enter service next spring.

The U.S.A.F. has authorised the production of four more KC-10s (cargo-tanker versions of the DC-10), bringing the total so far contracted for to six. Over the next few years the U.S.A.F. plans to procure at least twenty KC-10s. The four new aircraft will be delivered between July and October 1981 and all will be based at Barksdale AFB, Louisiana. Sales of the DC-10 in all versions now total 355

Toa Domestic Airlines (TDA) of Japan have ordered three more DC-9 Super 80s, increasing their total to eight. TDA will take delivery of their first five Super 80s next year and the remaining three will follow in 1981.

Air California of Newport Beach, California, have ordered two DC-9 Super 80s for delivery in early 1981 and placed options on two more. They will be powered by Pratt & Whitney JT8D-217s providing about 1,500 lb. more thrust each than the JT8D-209s specified for earlier models. Orders for the DC-9 Super 80 now total seventy and there are options on a further twenty-six.

As can be seen from the picture reproduced here, the first DC-9 Super 80, N980DC, made its maiden flight at

The McDonnell Douglas DC-9 Super 80, N980DC, taking off from Long Beach on its first flight, 18th October; it landed at Yuma

Long Beach on 18th October. Douglas's chief engineering test pilot H. H. ("Knick") Knickerbocker, who flew the aircraft, reported that "She handled beautifully".

Boeing orders

Transamerica Airlines—the new name recently adopted by Trans International Airlines of Oakland, California—have ordered three more Boeing 747-200C convertibles for delivery in May 1981 and April and May 1982. The first of two 747Cs previously ordered by the airline is due to be delivered this month and the second will follow in March 1980. Transamerica also have options on a further three 747s which if taken up will make a total of eight.

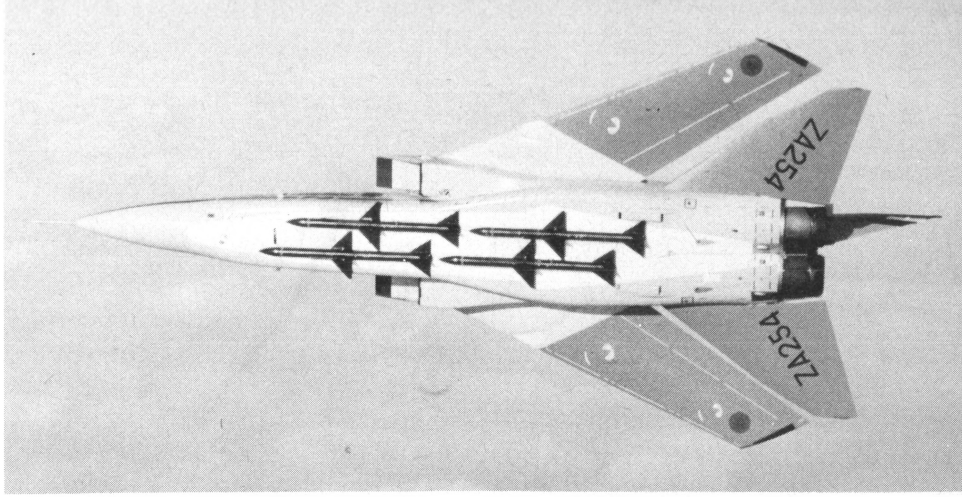
An earlier 747 order which slipped through the net was the announcement of a second 747F for Cargolux Airlines International, the Luxemburg cargo charter carrier; it has already been delivered. Sales of the Boeing 747 now total 510.

JAT-Yugoslav Airlines have ordered two more 727-700s, bringing their total to nine. They are due to be delivered in November and December 1980.

Eastern Air Lines, who already operate 128 Model 727s, have announced the purchase of ten more. Delivery of the new aircraft, all 727-200s, will start in October 1980 and be completed before the end of that year. Eastern plan to sell off twenty-three of their earlier 727-100s. Sales of the Boeing 727 now stand at 1,715.

Pan American World Airways announce that they have acquired two new 727-200s which will be used initially on internal German services linking Berlin with Frankfurt and Munich. Pan Am also have thirteen 727-100s.

CP Air of Canada have ordered four of the new-generation 767-200s, to be delivered in 1983, and placed options on a further four. They will be powered by General Electric CF6-80A engines. Orders for the Boeing 767 now total 125 and there are options on a further 118.



Panavia Tornado F.2 first prototype, ZA254, on its maiden flight from BAe Warton, 27th October, during which it reached Mach 1.2 while carrying four Sky Flash missiles. Efforts are now being made to get the first of 165 Tornado F.2s for the R.A.F. into service earlier than the planned date of 1984

Sikorsky SOTAS

Sikorsky have received a $36.6 million contract from the U.S. Army to develop a new helicopter called the EH-60B SOTAS (Stand-Off Target Acquisition System). Eight prototypes are to be built and the first will fly before the end of next year.

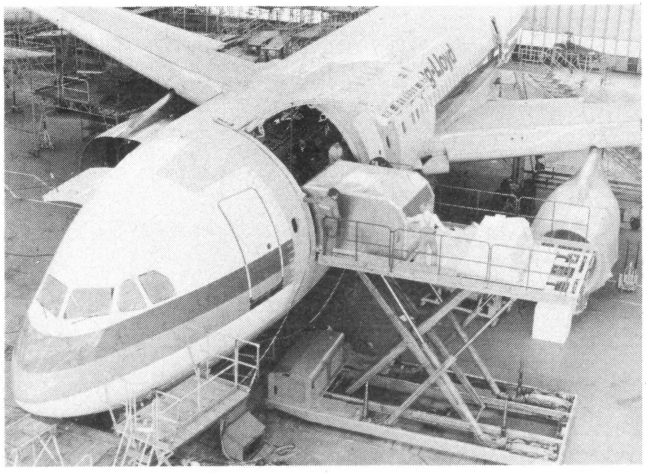
Derived from the UH-60A Black

Above: *Israel Aircraft Industries Westwind 2 4X-CMK, unveiled on 25th September, incorporates the manufacturers' new Sigma wing system—improved profile plus winglets to reduce induced drag*

Above: *First of a new batch of Messerschmitt-Bölkow-Blohm HFB 320 Hansa Jet ECM trainers for the* Luftwaffe, *D-CANO flew at Hamburg-Finkenwerder on 22nd August. Total order is for fifteen*

Below Left: *Artist's impression of the Sikorsky EH-60B SOTAS helicopter being developed for the U.S. Army—see news item above*

Below Right: *The first A300C4-200 convertible Airbus was rolled out by VFW-Fokker at Bremen-Lemwerder on 9th November. Destined for Hapag-Lloyd, it has a 141 in. X 101 in. cargo door*



First of eight Bell 212s for the Civil Aviation Administration of China (CAAC), 724 was delivered on 16th October. It and three others have pop-out floats and will be used for offshore oil support. Two 212s will be employed on geophysical work and two on forestry operations

World Air News . . .

Hawk, the EH-60B will have a rotating aerial under its belly and a data terminal inside the cabin. Primary mission of the aircraft will be to detect enemy movements on the battlefield and relay the information to commanders on the ground.

The U.S. Army plans to procure more than 100 SOTAS helicopters.

HS 748s for Mountain West

Mountain West Airlines of Boise, Idaho, have ordered five Hawker Siddeley HS 748s for delivery starting next year and placed options on a further five. They will be used on routes to Salt Lake City, Sun Valley, Reno and San José.

This is the first order for the HS 748 from a short-haul operator in the U.S.A. following the introduction of the country's new de-regulation measures. Sales of the HS 748 now total 347.

Heli Orient order 43 Bells

Heli Orient (Pte.) Ltd., the Singapore-based sales and support organisation, have ordered forty-three Bell helicopters which, with related equipment, are valued at more than $50 million.

The order comprises twenty-one Model 206B Jet Ranger-IIIs, eight 206L-1 LongRanger-IIs, four 205A-1s and ten 212s with the improved Pratt & Whitney PT6T-3B Twin Pac powerplant. All are due to be delivered in 1980. In addition, Heli Orient have placed options on ten of Bell's new four-bladed Model 412 helicopter (scheduled for production in 1981) and ordered twenty kits to convert 212s to 412s.

Largest firm of their type in Asia, Heli Orient also have eight Bell 222s on order under a previous contract.

Chinooks for Bristow

Bristow Helicopters—the world's largest helicopter operators, with more than 200 aircraft in service—have ordered five Boeing-Vertol Commercial Chinooks for delivery starting in 1981.

The Commercial Chinook can carry up to forty-four passengers over distances of 600 miles at a cruising speed of 140 kt. Maximum slung cargo load is 28,000 lb. Orders for the Commercial Chinook now total eight plus options on a further seven.

Canards for Concorde?

Existing Concordes may be fitted with canard (foreplane) control surfaces, which would reduce landing speeds, under a scheme put forward by the manufacturers, British Aerospace and Aérospatiale.

The foreplanes would be of about 14 ft. span, controllable in pitch, allowing the elevons to be used as flaps, but would not retract (unlike the canards on Russia's Tupolev Tu-144).

Raytheon/Beech merger

The Raytheon Co. and Beech Aircraft Corp. have agreed in principle to merge. It is intended that Beech, with 10,000 employees, will continue to operate as a separate entity under their present management and at their present locations. Raytheon employ nearly 65,000 people.

B.CAL service to Rhodesia

British Caledonian Airways are planning to introduce a twice-weekly service between London (Gatwick) and Salisbury, Zimbabwe-Rhodesia, as soon as a constitutional settlement is agreed. The service would be an extension of the present schedules to Lusaka using Boeing 707-320Cs. The airline operated services to Salisbury until these were suspended following Rhodesia's UDI in 1965.

Boeing Military

Boeing's military interests have been reorganised and formed into a new firm, the Boeing Military Airplane Co., by merging the relevant facilities at Wichita (14,000 employees) and Seattle (800 employees).

Military work at present in hand at Wichita includes B-52 and KC-135 modernisation, cruise missile carrier integration, and Rockwell B-1 avionics development. The Seattle group is in the final stages of the U.S.A.F. AMST competition, being responsible for the Boeing YC-14.

Air UK

A new British independent airline, Air UK, was formed on 16th October by merging British Island Airways, Air Anglia and BIA/Air West. It now becomes Britain's third largest scheduled carrier, after British Airways and British Caledonian.

All three constituents belong to the British & Commonwealth Shipping Group whose other aviation interests include Bristow Helicopters, Servisair and Airwork Services.

Air UK expect to carry more than 1¼ million passengers during their first year of operation, using a fleet of forty-two aircraft; four BAC One-Elevens, two Fokker F.28 Fellowships, ten F.27 Friendships, twenty Handley Page Heralds and six Embraer Bandeirantes.

CAAC to use Gatwick

The British Airports Authority announce that the Civil Aviation Administration of China (CAAC) will be starting services between Peking and Gatwick on 1st April 1980. This follows

Delivered to the R. Hong Kong Aux. A.F. in October, Cessna 404 Titan HKG-4 replaces a Musketeer and will be used for patrol work (Photo: Elfan ap Rees)

the signing of an air services agreement between Britain and China in London on 1st November (see also September issue, page 334).

The Chinese airline intends to operate two services a week using a Boeing 707, with a stop in the Middle East to refuel.

No. 42 Squadron, R.N.Z.A.F., at present operates four Hawker Siddeley Andovers, including NZ7622 (a VIP transport) seen at its home base of Ohakea. Cheat line is light blue outlined in dark blue and white (Photo: P. J. Cooper)

NEWS IN BRIEF

The R. Danish A.F. may increase its order for Grumman Gulfstream IIIs (see September, page 335) from three to ten, the additional aircraft to be used as transports.

D. H. Canada have decided to go ahead with their Dash X transport (see August, page 292) which has now been given the designation DHC-8.

The Indian A.F. has selected the Antonov An-32 ("Cline") to re-equip five tactical transport squadrons. About 100 An-32s will be ordered.

The Tunisian A.F. has ordered eighteen Agusta-Bell AB.205 helicopters which will be operated on behalf of the Army.

Two Canadair CL-215 water-bombers were provided by the manufacturers to assist Los Angeles authorities combat the recent brush fires in Southern California.

Air Botswana are to lease two Lockheed Hercules freighters. Current equipment includes an HS 748, Viscount and Twin Otter.

The McDonnell Douglas YAV-8B Advanced Harrier prototype recently carried out trials aboard the helicopter-carrier U.S.S. *Saipan*.

The Royal Australian Navy has a requirement for ten helicopters for use aboard its new guided-missile frigates now under construction.

Stretched Boeing 747 version now under consideration would have a 27 ft. longer fuselage and seat 520 passengers.

The Lebanese A.F. has ordered six Agusta-Bell AB.212 helicopters.

Two Sikorsky S-76 Spirit helicopters recently flew 5,000 miles on delivery to VOTEC Servicos Aereos Regionais of Rio de Janeiro, Brazil. They are now at work on offshore oil support for Petrobras.

CP-1320 is the designation of a new French two-seat light aircraft designed by Claude Piel. Powered by a 160-h.p. Lycoming, it has a retractable undercarriage. The prototype is nearing completion.

Air National of San José, California, have ordered their second Aérospatiale SN.601 Corvette and placed options on four more.

The Mali Government has ordered an Aérospatiale SN.601 Corvette, the seventh African country to adopt the type.

Increased R.A.F. use of Canadian facilities for low flying was among the subjects discussed by the R.A.F. Minister, Mr. Geoffrey Pattie, during his visit to Ottawa in October.

Embraer of Brazil are developing a new thirty-passenger commuter airliner, the EMB-120, which will be powered by two 1,500-s.h.p. Pratt & Whitney of Canada PT7A-1 turboprops.

Colt Aviation, a division of the Colt Car Co. of Cirencester, have purchased an Agusta-Bell JetRanger, G-BCVZ, for executive charter work.

Lockheed Aircraft Service Co. have received a £21.3 million contract for continued maintenance of the forty-seven Lockheed F-104G and TF-104G Starfighters used by the *Luftwaffe* at Luke AFB, Arizona, for German pilot training.

Aerolineas Argentinas took delivery of two Boeing 747-287Bs in October, increasing their fleet to four, and plan to acquire a further three 747s during the next two years.

The Indian A.F. took delivery of its second pair of Sepecat Jaguar Internationals on 14th October, again a two-seat "B" and single-seat "S" (see September issue, page 333).

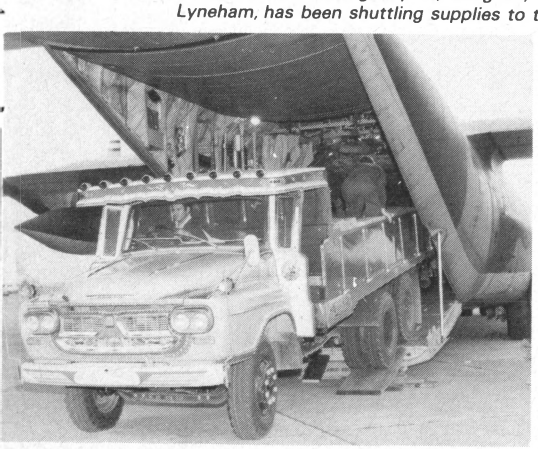
Air Continental of Luton plan to start a twice-daily service to Brussels on 1st February using a Piper Chieftain and later the Embraer Bandeirante they have on order.

Short Bros. have suspended their plans to assemble Piper Tomahawks at Belfast owing to procedural difficulties connected with FAA certification.

Rotor-Aire Inc. of Madison, Wisconsin, U.S.A., have ordered twelve Hughes 500D helicopters for delivery in late 1980 and early 1981.

Kamov Ka-34 is the designation of a new Russian transport helicopter designed to seat twenty passengers.

Scenes at Don Muang Airport, Bangkok, Thailand, where since 9th October Lockheed Hercules C.1 XV189 of No. 24 Squadron, R.A.F., Lyneham, has been shuttling supplies to the famine-stricken inhabitants of Kampuchea (formerly Cambodia). Call-sign is "Red Cross 88")



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Air Affairs

A monthly commentary by JOHN STROUD

AS THE last two decades of the century approach we can get a fairly good idea of which types of aircraft are going to be in airline service as we pass into the 21st century. The year 2000 has for many years fascinated writers, artists and forecasters, and we have been shown many weird and wonderful shapes of things to come.

But it isn't going to be as depicted. The sky will certainly not be full of DC-3s but it is highly unlikely that it will be full of supersonic transports either. If the worst of the fuel pessimists are proved right then of course it won't be full at all.

However, enough is going on to make one believe that fuel will be available, as we know it, for at least the first few decades of the next century—if this were untrue I doubt whether there would be Boeing 757s and 767s and the orders which are being placed for them.

There is a whole range of predictions about air traffic growth but even on the most pessimistic assumptions it would appear that the volume of traffic must about treble over the next twenty years.

Up to 30th September this year Boeing had received orders for 40 Model 757s and 96 Model 767s. These are new aircraft, yet to fly, but they owe much to the present Boeing family of jets. Model 747s have now passed the 500 mark with 16 ordered in September, by chance the Model 737 had attracted 737 orders, and the 727 had exceeded 1,700.

Also, there are recently delivered 707s and yet the type has been in service for more than twenty years. As today's structures are better than those of twenty years ago it is difficult to believe that 747s, 737s and 727s will not be flying the air routes beyond the year 2000. Boeing jet transports ordered now total more than 4,000 of which 1,667 have so far been exported, so there seems every possibility that the 6,000 total may be achieved by the end of the century.

At McDonnell Douglas the picture looks similar although fewer types are in production. By the end of September there were firm orders for 346 DC-10s, with options held on another 45. DC-9 orders came to 1,034 with 33 on option and the Super 80 series has only just begun its flight-test programme. To the Douglas jet total must be added the 556 DC-8s, numbers of which are now to be re-engined to meet the new noise regulations and cut fuel consumption. The "Eights" are unlikely to fly beyond the century, except perhaps in very small numbers, but "Nines" and "Tens" certainly will be around unless something very extraordinary happens.

If all the TriStar options are taken up, then before too long Lockheed will have taken more than 300 orders and this type, too, is going to be around for a long time.

In Europe the Airbus A300 and A310 are gaining momentum and satisfactory orders are coming in. So we add the Airbus to the list of 21st century aircraft. It must also be regarded as pretty certain that Fokker will build a twin-jet that will be around for the next 20–30 years, whether it be a Super F.28 or finally appears under another designation.

What the Russians do in the way of civil airliners needn't worry us very much—that is mainly Aeroflot's problem.

What of Britain?

But what of Britain? We have the BAe 146 although I see no sign of airlines rushing to place orders.

Much more disturbing is why have we thrown away the opportunity to develop the BAC One-Eleven? Much of the future work for Douglas and Boeing is coming from development of older types—the 727s, 737s and DC-9s. Why do we not want to enjoy the same success with the One-Eleven?

The One-Eleven was the first in its class and when Douglas announced the DC-9 it was anticipated that the market was for a thousand split between the two. Then came the third entry, the Boeing 737. Between them the DC-9 and 737 have attracted more than 1,770 orders and yet the One-Eleven hasn't even taken a third share of the *original* estimate.

The One-Eleven is a delightful aeroplane and deserves better. Surely it is not too late to refine, re-engine and stretch the One-Eleven and capture some of the market for this category of airliner. It should be possible to keep a British transport aeroplane in production.

Have we become so obsessed with our share in the Concorde that a saleable product is regarded as beneath our dignity? So far the great new British Aerospace Corporation seems to have initiated precisely nothing. Is our slogan to be: "Britain—Sub-contractors to the World"?

Braniff evening with L.S.A.B.

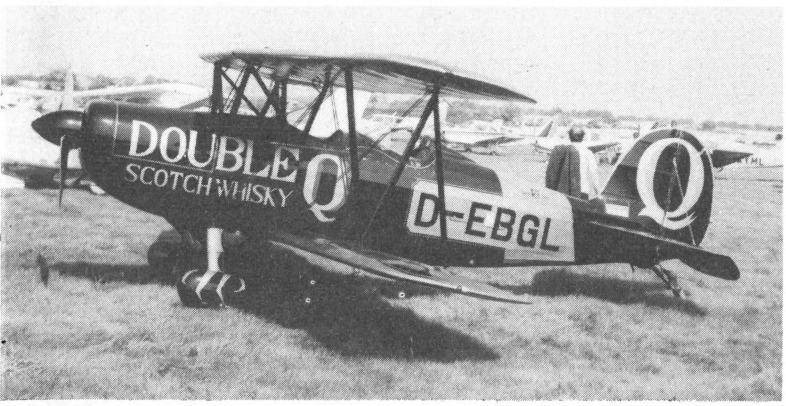
GUEST SPEAKER at the Wednesday, 12th December meeting of the London Society of Air-Britain will be Robert T. Phinney, Regional Vice-President U.K. of Braniff, who will give a talk with films on Braniff International Airways. The meeting will start at 7.00 p.m. in the Lecture Theatre, Holborn Central Library, 32-38 Theobalds Road, London W.C.1; non-members welcome, admission 60p.

Seen at Cranfield

Notes and photos by J. M. G. GRADIDGE

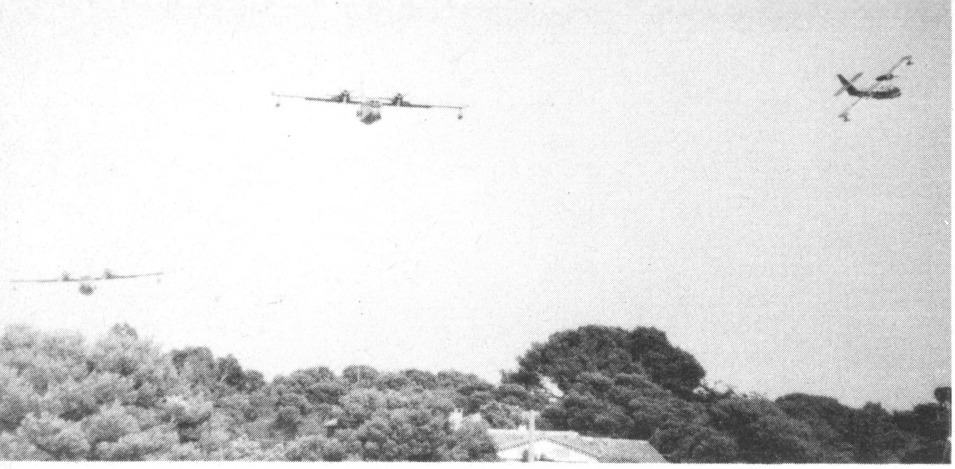
Left: *Among the newcomers to "Flight International's" Business and Light Aviation Show, held at Cranfield on 6th–8th September, was Cessna 550 Citation II G-BFLY belonging to Northair of Yeadon*
Right: *Heliwork exhibited Bell 47 G-SOLY fitted with the Soloy turbine; note large exhaust pipe*

Left: *Cessna T.188C AGhusky N2425J fitted with both spraying and dusting gear. It has a bigger wing than the AGwagon.* Right: *Piper Navajo N200BE is a Panther modified version, flown over from New York by Colemill Conversions for a Class C1(e) record of 14 hr. 42 min. It later broke a further Class record by climbing to 9,000 m. in 19 min. 10 sec.*



Above Left: *Among the interesting visitors was Great Lakes 2T-1A-1 D-EBGL which came over from Germany in company with Scheibe SF-28A powered glider D-KHOS.* Right: *Pitts S-2A G-RKSF is one of the new Rothmans team aircraft to be used on overseas tours*

Below Left: *First British-registered Maule Lunar Rocket M-5-235, G-RAIN was displayed by Capital Aviation Sales. Five have been sold here so far.* Right: *Robin HR 100/260 6V-AEK came all the way from Senegal, its passengers complaining of the cold!*



Three Canadair CL-215s of France's Sécurité Civile sweep back over Fréjus after gathering fresh loads of water from the bay

Fire-fighting at Fréjus

Story and photos by JOHN CHAPMAN

AT 4.30 P.M. on Wednesday, 8th August 1979 I was lying on the beach at Fréjus, on the French Mediterranean coast, watching the antics of a solitary Aéronavale Super Frelon from the Fréjus-St. Raphael air station some two miles along the coast. The Frelon, together with a surprisingly active Nord 1101 Noralpha (No. 152) also belonging to the French Navy, constituted the only aviation activity. I was lamenting my earlier decision not to go to Miami and "Corrosion Corner", but consoling myself with the surrounding beauty and the views of the ever-present and admirably designed 1979 season topless bikinis—plus the thought that I would otherwise be back in my office in Australia.

My attention was taken by a large and apparently growing pall of dark grey smoke rising from somewhere behind a nearby hill but well within the outskirts of the town. Being familiar with bush fires and recognising the colour of the smoke, I was immediately stirred at the prospect of being able to watch a Canadair CL-215 water-bomber in action.

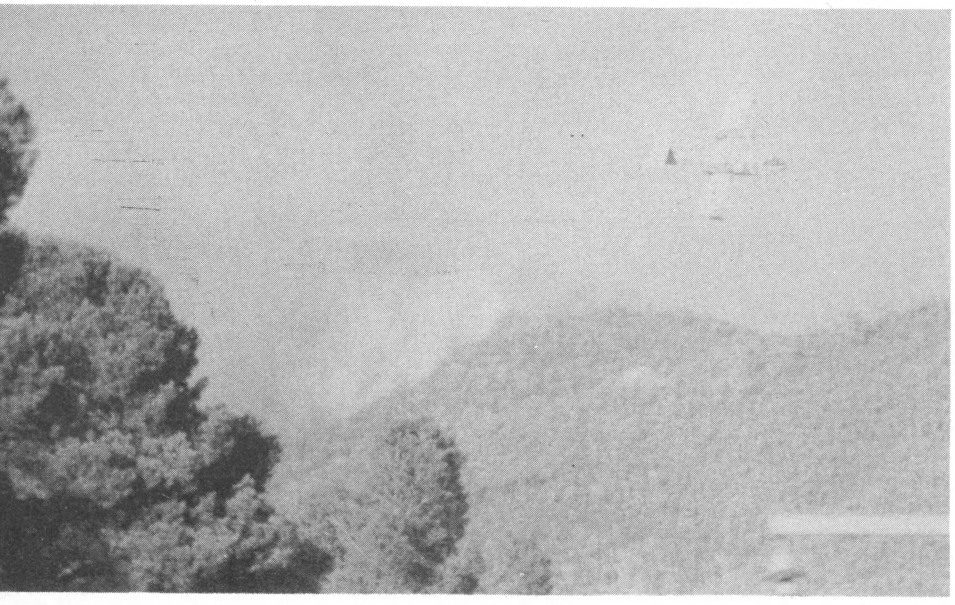
Within half-an-hour a considerable number of fire-fighting units had raced past, heading towards the ever-growing curtain of smoke. An air of tension and excitement gradually pervaded the beach. As the number of passing civilian fire control units became interspersed with military units and trucks full of off-duty military personnel, it became apparant that something big was brewing.

There was a steady north wind blowing, which while not yet sufficient to make the beach uncomfortable, was obviously strong enough to make the "Pompiers Secours" very concerned. At that time the word "Mistral" was a long-lost memory of school days, that once had something to do with geography lessons, wind and the Rhône Valley. These days it had far more significance in being the name allocated to the French-built version of the de Havilland D.H.100 Vampire and the fact that the earliest gap in my spotting log is for the serials of four French A.F. Mistrals seen at the Biggin Hill Battle of Britain display in 1955 (any ideas?).

During the next few days the significance of the name Mistral was to come home to me and the reason why the wind of that name so worries the French authorities that they purchased their fleet of eighteen Canadair CL-215s, which they have now supplemented with a Douglas DC-6B, F-GAPK c/n. 43834.

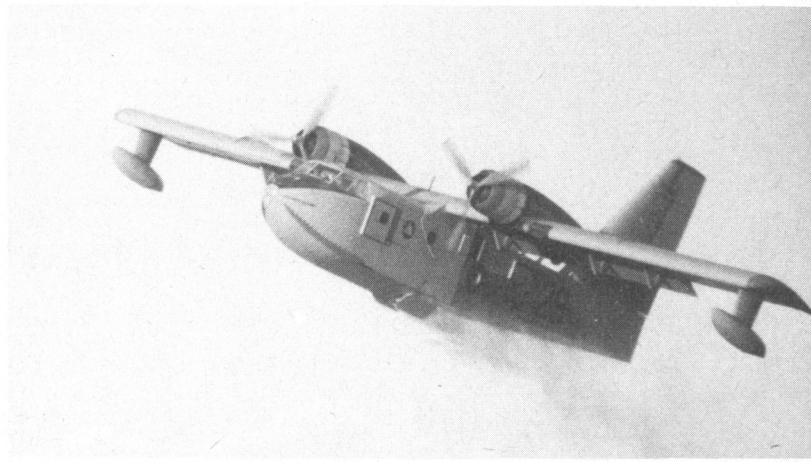
Soon after 5 p.m. I spotted an all-red Alouette III, flying around the smoke, and was then enthralled to see two Canadair CL-215s arriving from their base at Marseille-Marignane, to the west. By this time a number of people were on their feet watching the

(continued on page 466)



Left: *CL-215 F-ZBBI, half-hidden by smoke, has dropped its load on a hillside and begins to level out from a tight right-hand turn. Aircraft carry the last two digits of their c/ns. as codes—F-ZBBI is "27", c/n. 1027*

Below: *Two views of F-ZBBW "47", c/n. 1047, scooping up water, to a maximum of 12,000 lb.*



CL-215s seen in action on this page include F-ZBBR "01", c/n. 1001, the first Canadair built; originally CF-FEU-X, it first flew at Cartierville on 23rd October 1967. Other aircraft are F-ZBBD "29", c/n. 1029 (centre right); *F-ZBBW "47", c/n. 1047* (below); *and F-ZBBI "27", c/n. 1027* (bottom right), *starting its bombing run over Fréjus*

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Fire-fighting . . .

spectacle, although all of the action was taking place some four miles away. After a preliminary investigation of the fire, the two Canadairs dived towards the sea in the next bay, just out of sight, to reappear seconds later now heavily laden, climbing noisily out of our bay.

Within minutes the two yellow and red amphibians were back for more water and, joy of joys, this time they came down into our bay. With the sound of 8,400 horse-power of Double Wasps reverberating across the bay as the CL-215s scooped up their 5 tons of water, many more people were now taking an interest. I was just as surprised to see my wife rise from her beach towel and take a disdainful look in the general direction of the noise, as I was to see more Canadairs flaring out at the eastern end of the bay while the first pair of aircraft were banking out of the western end.

Each successive aircraft was apparently landing closer to the shore and I recalled reading an article which stated that these aircraft always landed beside the wake of proceeding aircraft rather than in it. The four CL-215s were by now making frequent circuits of about five minutes' duration and there seemed to be at least one aircraft landing, skimming the surface or climbing out of the bay all the time. It became apparent to me that the aircraft would soon be alighting fairly close to the harbour wall, once the bay had been cleared of the various small yachts, pedalos and swimmers.

With a hasty word to my wife, I grabbed the car keys and raced off towards our hired Peugeot 504, forgetting shirt, shoes and money in my excitement. By the time I reached the harbour wall the noise of twelve Double Wasps and the sudden realisation that "Pelican 01" and "Pelican 46" had joined the campaign led me to believe that the fire had by now taken quite a hold and was spreading within the outer, affluent suburbs of Fréjus, where the residents live in seclusion among well-timbered hillsides.

The atmosphere in the town was by now electric, with the noise of the six Canadairs ever present and now close enough to see the pilots' faces as they flew 100 ft. overhead, then banking their aircraft sharply to the right, dropping steeply to the sea, only 200 yards further on, then gunning their engines as the aircraft's all-up weight was suddenly increased by 12,000 lb. in a matter of 12–15 seconds. In the town sirens wailed as ever more fire units arrived and with the noise continuing all evening there must have been several hundred units present by the time it got dark. Everyone on the beach had by now become engrossed in the spectacle.

After I had shot several rolls of film at the beach, it dawned on me that the action would continue for some while and that I would have plenty of time to drive to the fire and take some photos at the other end of the sequence.

Within ten minutes I had found an area which the CL-215s had recently dowsed and parking the car, I grabbed my Pentax, a few rolls of film and started to run in the general direction of the blaze, oblivious at the time (although I was later to be grateful) that my delicate English feet had been tempered by twelve summers of barefoot activity in the Antipodes.

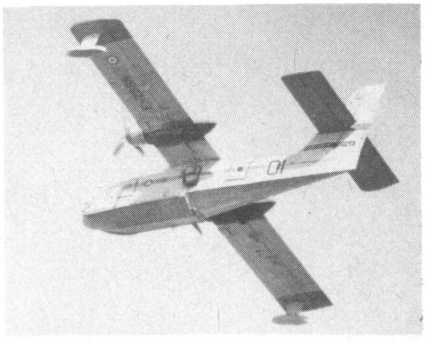
During the next couple of hours I ran miles, from one location where I thought I could see the fire to another, managing only a few distant shots of the Canadairs dropping their loads. Eventually I returned to the car, only to find an excited crowd of onlookers and an even more anxious crowd of house-owners, keeping a sharp eye on a part of the fire which had flared up again only 75 yards away.

The fire was slowly creeping towards a group of houses and it was obvious that the Canadairs would soon be visiting the area again, so all I had to do was to wait. I was soon rewarded and able to watch, as close as I cared, the dropping operations of the water-bombers; the only people closer than myself were the firemen directly under the aircraft, who were no doubt grateful for their regular drenchings. I was particularly interested to see the aircraft lurch 20–30 ft. upwards as their burden was lightened in the space of a couple of seconds.

The CL-215s were bombing the fires from less than 100 ft. and I was pleased to read in the newspapers, during the succeeding days, as the fires grew to an alarming extent all along the coast, that the pilots of the "Pelicans", as their call-signs aptly proclaim them, were lauded by the press as heroes, a tribute which they rightly deserve.

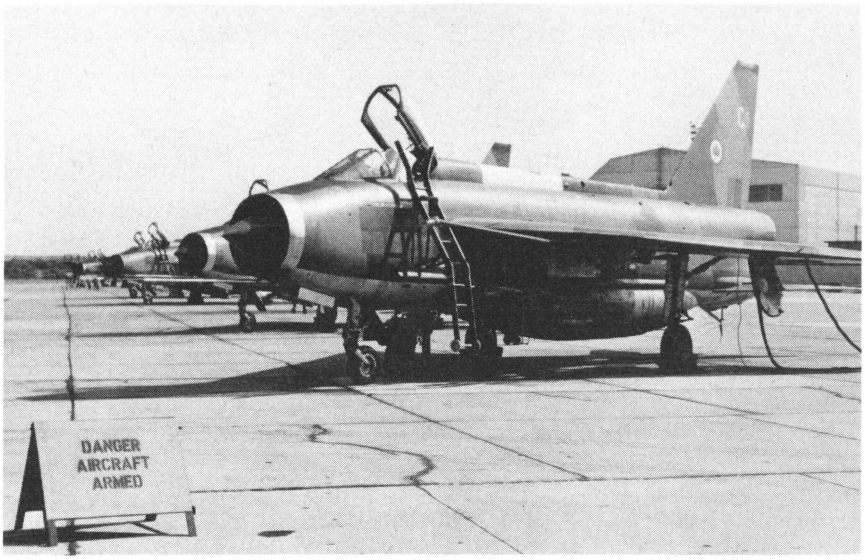
The excitement for me ended four hours after it had started, when I returned tired, dirty and very thirsty to the beach, to find it almost in darkness and deserted except for my wife who, it turned out, had been thrilled by the spectacle and noise of the Canadairs for the whole time.

A comprehensive article on the Canadair CL-215 appeared in the March 1976 issue.—Ed.



Lightning A.P.C. in Cyprus

by ELFAN ap REES



Lightning F.6 XR771 "C" heads this line-up of No. 5 Squadron aircraft at R.A.F. Akrotiri on 18th September. The notice in the foreground is for real! The large hangar in the background was designed originally for Beverley maintenance (Author's photos)

THE TWIN-ENGINED bomber flying east over the Mediterranean had just levelled out on to a new course when a glint of sunlight gave them away. Two camouflaged fighters coming in from the flank with less than a mile between them. Inside his pressurised capsule the bomber pilot could see little and hear nothing. He knew the attacking aircraft were Lightnings and he knew they wore a pair of Aden cannon around their waists; he also knew he was defenceless and that he could do nothing until it was all over.

The Lightnings took mere seconds to make their passes and the Adens belched but momentarily, yet leaving a neat pattern of holes in their target. Then the swept-wing fighters peeled away into the distance and the bomber began a slow descent towards a small patch of green that had appeared on the sea-blue horizon.

On the island sun-bathers near the local air base looked up as they heard the bomber approaching. Something was hanging in the slipstream behind its tail and the aircraft seemed a trifle high for a safe landing. It soon became obvious that the bomber was going to overshoot and go around again but, as it reached almost the end of the runway, the watchers saw something detach itself from the tail and flutter to the ground. The bomber continued on, completed its circuit, and landed safely.

★ ★ ★

Meanwhile at R.A.F. Akrotiri in Cyprus anxious observers had already driven out on to the airfield to collect the target banner dropped by No. 100 Squadron's visiting Canberra. The Lightning pilots of No. 5 Squadron on A.P.C. (Armament Practice Camp) were anxious to check their scores!

A.P.C.s have long been part of R.A.F. life and all the operational squadrons based in the U.K. and Germany enjoy at least one session every year "down on the range". Missile firing is traditionally carried out off Aberporth in mid-Wales, using R.A.F. Valley on Anglesey as the squadron base, but gun firing has been exercised from bases in Malta, until that facility was lost, and at St. Mawgan in Cornwall which, despite the attraction to holiday-makers, does not possess ideal weather conditions for such a concentrated task.

R.A.F. Akrotiri, however, situated on the southern tip of Cyprus, lends itself very much to the needs of an Armament Practice Camp. This large station, which once housed 12½ squadrons of various R.A.F. aircraft, is now almost vacant, the only permanently based aircraft being four Whirlwind helicopters of the local search and rescue unit ("A" Flight of No. 84 Squadron, see November issue, page 448) and a pair of Lockheed U-2s, which seem to take it in turn to make a daily flight to who knows where and why. A squadron of Lightnings or Phantoms, therefore, is hardly noticeable among the visiting VC10s, Hercules, and the odd V-bomber that occasionally share the acres of concrete.

The squadron at Akrotiri for its annual A.P.C. at the time of my visit was No. 5 Squadron, normally based at Binbrook, Lincs. This was No. 5's first visit to Cyprus and they had brought with them a total of ten Lightnings and sixteen aircrew, together with the necessary equipment to give them full ground support. To get the Lightnings to the far end of the Mediterranean had also called for the support of three Victor K.2 tankers from R.A.F. Marham, Norfolk. These refuelled all the Lightnings over the sea just south

Lightning F.3 XP694 "R" is used for operational work-outs where the use of fatigue-limited F.6s is not desirable

F.6 XR759 "H" being refilled with Avpin. White-painted patch on the spine covers the Avpin tank and engine starter mechanism

of Nice before two of the tankers returned to Marham, although not before they had also topped up the third Victor, which then escorted the No. 5 Squadron fighters through to Cyprus. This clever arrangement was, of course, designed to cut down the Marham bed and breakfast bill at Akrotiri!

The Lightnings had arrived at Akrotiri on 31st August, so that by the time I paid the squadron a visit in mid-September the pilots were half-way through their five-week training programme. Their temporary home had once been occupied by a maintenance unit and the Lightnings were being serviced in a large hangar of unusual shape, designed originally to take the Blackburn Beverley.

Lightnings on view consisted mainly of F.6s but also present were a single F.3 and a T.5. The role of the latter is primarily to give inexperienced pilots some initial weapons training practice alongside an instructor, but it is also used as a simulation intruder for the F.6s and to give ground crews some air familiarisation.

The T.5 also occasionally joins the F.3 for combat exercise and intercept practice, work that is forbidden to the F.6 under peacetime conditions to conserve precious fatigue life. Average hours on the F.6 are 2,500 and the aircraft has to remain in the front-line until at least 1985, when the Tornado F.2 is due to enter service. This means that most of the Lightnings are likely to celebrate their 20th birthday before they finally retire, which says much for the design integrity but does restrict No. 5 Squadron a little in what it can do. This is especially true at an A.P.C., for the F.3 has a shorter range and no guns.

For the first two weeks of this particular A.P.C. No. 5 Squadron had been achieving an excellent serviceability record with their aircraft, with all ten on the line on several occasions. Since, without the aid of a trained mole, the tightly packed Lightning airframe has always been a maintenance man's nightmare, this was no mean achievement. Unfortunately the record was spoiled on the very day of my visit when the O.C. of R.A.F. Binbrook was forced to eject from his F.6 over the sea after a cockpit fire warning (see November, page 448).

Flying programme

The actual A.P.C. flying programme varies for each pilot according to his proficiency, but is based on two groups of sorties, the first called the "academic profile" and the second the "operational profile". In both instances the Lightnings attack a target banner being towed at a safe distance by a Canberra TT.18, provided by No. 100 Squadron. Two such aircraft were based at Akrotiri for this particular A.P.C., although only one is in use at any one time.

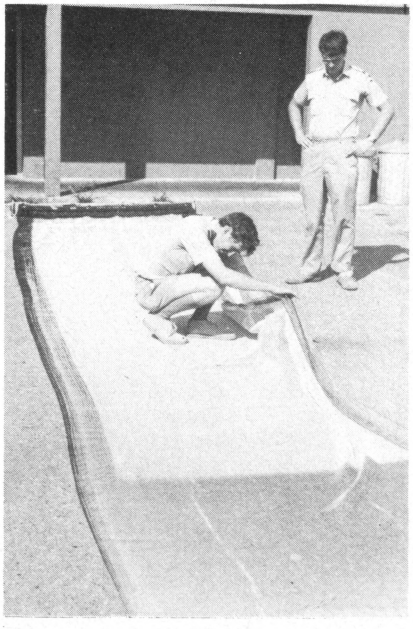
For the "academic profile" the Canberra goes out to the range area south of Cyprus and flies a repetitive figure-of-eight circuit at about 180 knots, while the Lightnings come out two by two, positioned about a mile apart, and then take it in turns to attack the banner at between 250–300 kt. and from about the 5 o'clock position. Initially they use only the ciné gun to prove adeptness, sometimes for only two passes but more usually for four or five. The pilot aims to open fire at just 400 yards range; then, back at base, the film is checked frame by frame by his colleagues and measurements are made to confirm the distance at which the pilot actually opened fire. It is a particularly important test for the Lightning pilot, since his radar-ranging equipment is so antiquated that it often doesn't work, and if he gets his range wrong he is most unlikely to hit the target at all.

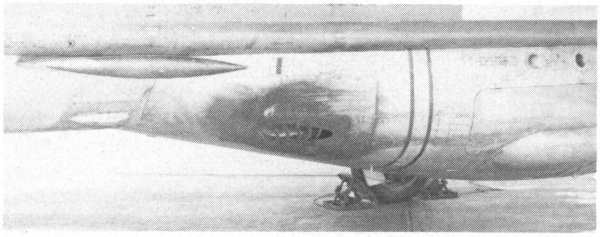
Having proved that he can do it with a ciné gun, the pilot is now allowed to have a go with real live bullets. These are first dipped in paint so that any subsequent holes in the target can be identified and claimed. In the F.6 the two 30-mm. Aden cannon are housed in the forward section of the ventral tank and, with a firing rate of between 1,200 and 1,400 rounds per minute, anyone brought up on a diet of war films might think that an awful lot of taxpayers' money gets used up in these live sorties. Not a bit of it—120 rounds only are fired in an "academic profile" sortie, so that the pilot has to be very quick and very accurate.

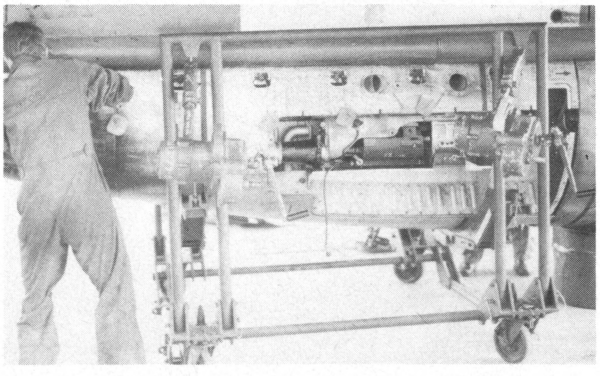
Due to the bullet spread, only a small percentage are expected to hit the target, 37 per cent being the theoretical maximum. Fifteen bullet holes through a target is therefore a fair score, provided that they all have the same coloured paint scars.

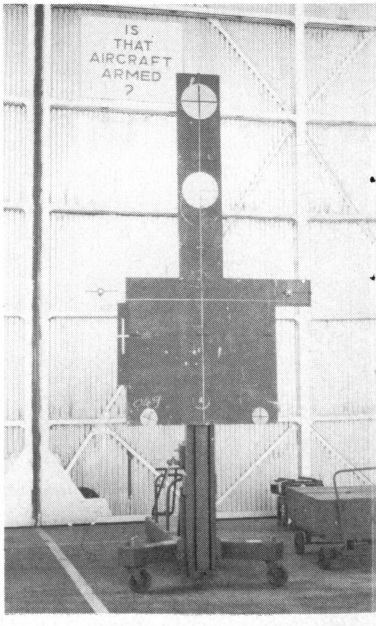
Once the pilot has achieved a NATO agreed standard on "academic profiles", he is able to move on to the "operational profile". For this the Canberra and its banner simulate an approaching intruder, and the Lightning has to get into position quickly for two firing passes only, before he has to clear the area for his wing-man. Since he now has only one-third of the bullets

Left: *F/Lt. Tim Neville checks for purple holes in a target banner recently vandalised by F/O. Charlie Mackleroy (standing).* Top Centre: *Close-up of a blackened gun port on Lightning F.6 XP756 after a sortie.* Bottom Centre: *The 30-mm. Aden cannon installation in F.6 XR758, revealed after the ventral pod front end had been removed.* Right: *Equipment used to harmonise the two cannon on the Lightning*

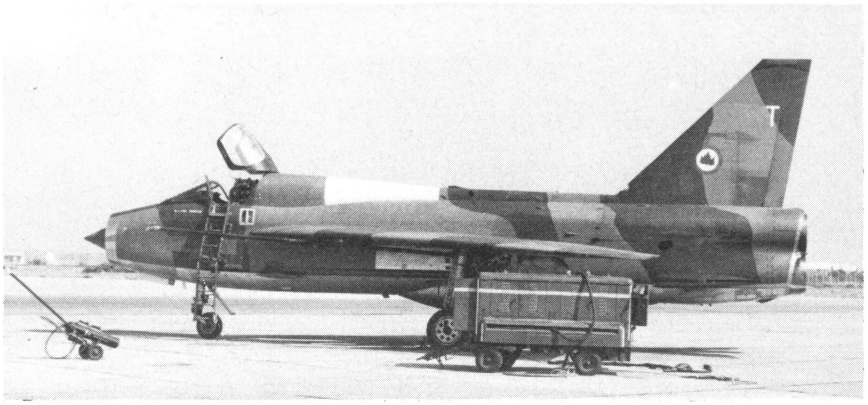


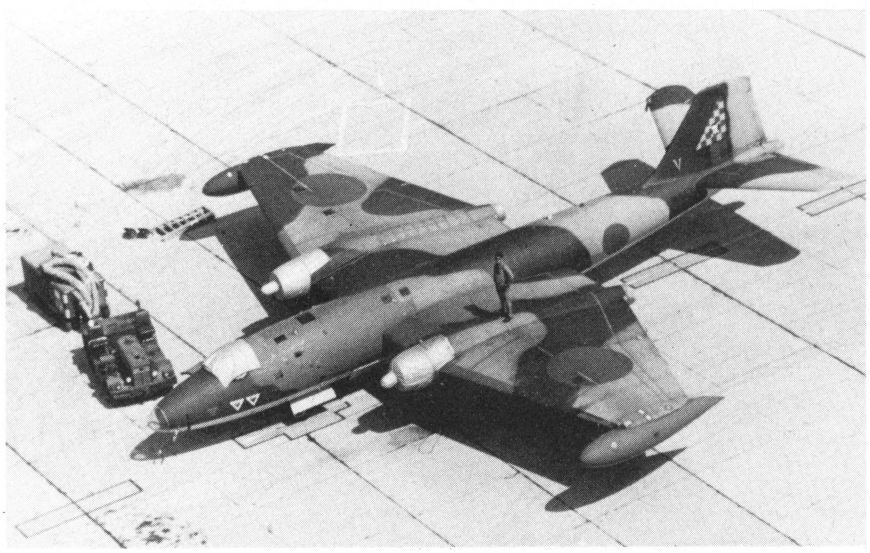






Top: *No. 5 Squadron's Lightning T.5, XS458 "T", was used for dual interception instruction*
Bottom: *One of the two Canberra TT.18s, WH957 "V", from No. 100 Squadron which provided the target banner towing for No. 5 Squadron's pilots*





used in the "academic profile" (i.e., 40), his timing and accuracy now need to be even sharper.

The average Lightning pilot is likely to complete about nine live-firing sorties during his A.P.C., the ratio of "academic" versus "operational" sorties depending on his individual skill. He will fly quite intensively and with very short sortie times for about half of the five-week A.P.C., and so the squadron splits in half and gets in some useful "housekeeping" experience as well. The pilots not flying act as film readers, administrators, target checkers, instructors, and fly the T.5 when required, until it is their turn to practise their skills. And skilled a Lightning pilot needs to be as we enter the 1980s, for it is an awful lot of all-weather interceptor for one man to handle!

Acknowledgments.—The author would like to thank F/Lt. Peter Stone and his No. 5 Squadron colleagues for allowing him to sit in on their annual A.P.C. and share their results.

No. 5 Sqn. Lightnings at R.A.F. Akrotiri, 18th September 1979: F.3 XP694/R; F.6s XR723/A (crashed 18/9/79), XS859/B, XR771/C, XS925/D, XR758/E, XS932/F, XP756/G, XR759/H; and T.5 XS458/T.

Kit News

by J. D. R. RAWLINGS

Revell reissues

CONTINUING THEIR policy of presenting us afresh with revised editions of their old kits, Revell have added to their reissue list the LTV A-7A Corsair II in 1/72nd scale and the Hughes OH-6A Cayuse in 1/32nd.

The Corsair II was a good kit when it first came out, accurate in outline and scale and neatly detailed, making up into a good model. Basically this judgment still applies although the moulds must now be somewhat tired for the fuselage/wing and wing/outer wing joints did not match up well during construction and needed some filling and filing. Otherwise it is a welcome reissue with no changes other than the transfer sheet which is for one of VA-86's Corsairs off the U.S.S. *America*. The sheet is incomplete and it is best to take most items from one of the specialist transfer sheets (*e.g.*, Modeldecal or Microscale who both do good A-7 sheets), adding only those from the kit sheet which particularly apply.

The 1/32nd-scale OH-6A has always been a good kit and an unusual subject for this scale. The model goes together well and looks the part when complete, even to the rather cheeky ground-sit of the real machine. The reissue contains a much more interesting transfer sheet with shark's-mouth and unit badges to make a colourful item of what would otherwise be a drab aeroplane.

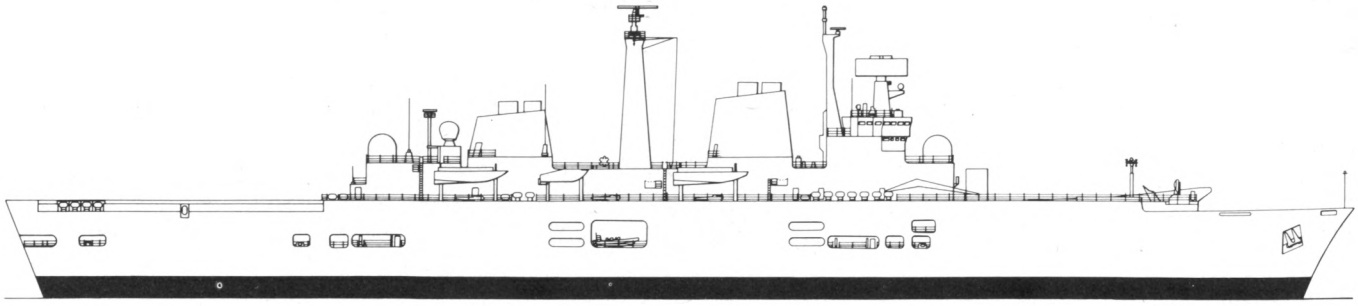
Airfix perpetuation

THE FLOW from Airfix continues with one new kit and three reissues, all in 1/72nd scale. The reissues include the Hawker Siddeley HS 125 Dominie T.1, for which there is no alteration to the plastic at all but a new transfer sheet makes all the difference; it has correctly sized serial numbers and markings for an aircraft from the College of Air Warfare, or one of the aircraft sporting the Cranwell blue fin band for the short time they were there.

A most welcome reissue, in Series 1, is the Bristol Bulldog IIA. This must be one of Airfix's most beautiful kits, a perfect gem which has been a collector's item ever since it first appeared. It now comes with a set of transfers for No. 17 Squadron, complete with black zigzags (thank you, Airfix, they're beastly to paint!).

The third reissue, in Series 5, is the Fokker F.27 now appearing as an F.27M Troopship with a well-produced transfer sheet for either one of the earlier Dutch grey, white and dayglo aircraft or the up-to-date camouflaged one. The opportunity has been taken to clean the kit up generally and bring it up-to-date by adding UHF blade aerials, etc.

The brand-new kit is in Series 2 and is the Hawker Hurricane I. This is a welcome subject for the Mk. I is the definitive Hurricane—the Battle of Britain winner— and hitherto we have had only the old and inaccurate Revell kit or the previous Airfix kit which had an error in the fuselage proportions. As with most Airfix kits, this model goes together well and the parts are beautifully detailed, the fuselage skinning being accurate and the wing panels just right. The undercarriage fits well, although the doors are a little thick. All the little details are there except for the pressure head under the wing. The outline and scale are correct and a good set of transfers portrays F/O. A. V. Clowes' aircraft of No. 1 Squadron during the Battle from July to October 1940 (and, incidentally, seen by your reviewer at both Croydon and Northolt during that period!). A fine addition to anyone's collection.



Britain's New Carriers

by NICHOLAS J. CHILDS

SURPRISING AS it may be to many, Britain is still building aircraft-carriers, albeit under another name, for the Royal Navy. The first of these ships, H.M.S. *Invincible*, is now undergoing final tests and fitting out, having already completed her contractor's sea trials, and will join the Fleet next spring. Although officially classified as "anti-submarine cruisers", she and her sister ships, *Illustrious* and the fifth *Ark Royal*, will be nothing less than a new generation of light carriers.

The design of these vessels appeared at a time when any suggestion that they might be the Navy's new carriers would have put their future in considerable jeopardy from politicians who regarded aircraft-carriers as expensive, unnecessary, and unacceptable symbols of Imperialist power. Unfortunately, to help disguise them as cruisers, an open forecastle was incorporated in the design. This has no operational value whatsoever but, on the contrary, reduces the flight deck space available for aircraft handling and flying operations.

Otherwise, these ships bear many of the hallmarks of modern aircraft-carriers: a through flight deck on top of a large hangar; a slightly angled runway; and an island superstructure offset to starboard. So, now that they will definitely operate Sea Harriers, calling these ships cruisers rather than carriers hardly seems valid. They may not have steam catapults or arrester gear, but they will be equipped with a device that will be as significant as these were in the development of naval aviation—the "Ski-jump" ramp.

However, the Navy has been unable to exploit the major advantage of V/STOL carriers over traditional strike carriers—that more can be built for the same money—owing to the succession of swingeing defence cuts that all the Services have had to suffer lately. That only three *Invincible*-class ships have been ordered is less of an indication of their cost than a comment on the size of the Navy's shipbuilding budget at the moment. For example, five of these vessels would collectively cost the British taxpayers about as much as their American counterparts are spending on each *Nimitz*-class carrier, of which the U.S. Navy will get four.

Furthermore, it must be admitted that the Sea Harrier is short on range and payload compared with the R.N.'s previous Phantoms and Buccaneers; and while the Sea Harrier may outclass the present rather crude Russian VTOL fighter, the Yak-36 "Forger", the Soviet Navy will not be content for long with an aircraft that cannot even use its carriers' flight decks for short take-offs. Therefore, the effectiveness of the *Invincible*-class ships as carriers will depend very much on how soon a more potent aircraft than the Sea Harrier is produced, as well as how long it takes to plug the Navy's AEW (airborne early warning) gap.

New fixed-wing "teeth" for the Royal Navy are now in being in the shape of the Hawker Siddeley Sea Harrier FRS.1, which first flew on 20th August 1978

Super Harrier

The only real candidate to succeed the Sea Harrier in the foreseeable future seems to be the BAe Super Harrier. Until recently a naval version of the R.A.F.'s AST.403 fighter-bomber might have been a possibility, but the V/STOL requirement has been dropped from this project to reduce the obstacles to co-operation with European partners on a joint aircraft.

The Super Harrier will mate the Sea Harrier's front fuselage to the 23,000-lb. thrust Pegasus 11-35 engine and a new big wing. It will offer a considerable payload advantage over the present aircraft and, with 245 gal. more internal fuel, greater range. Leading-edge root extensions (Lerxs) will be fitted to improve manoeuvrability in air combat, with longitudinal strakes on the gun pods and a retractable crossdam, known as "cushion augmentation devices" (Cads), to reduce suck-down and increase lift in VTO operations.

Apart from the extra internal fuel, the new wing will feature six pylons instead of four, and the outriggers will be moved further inboard to reduce track. This will benefit aircraft handling on confined carrier decks, and wing-

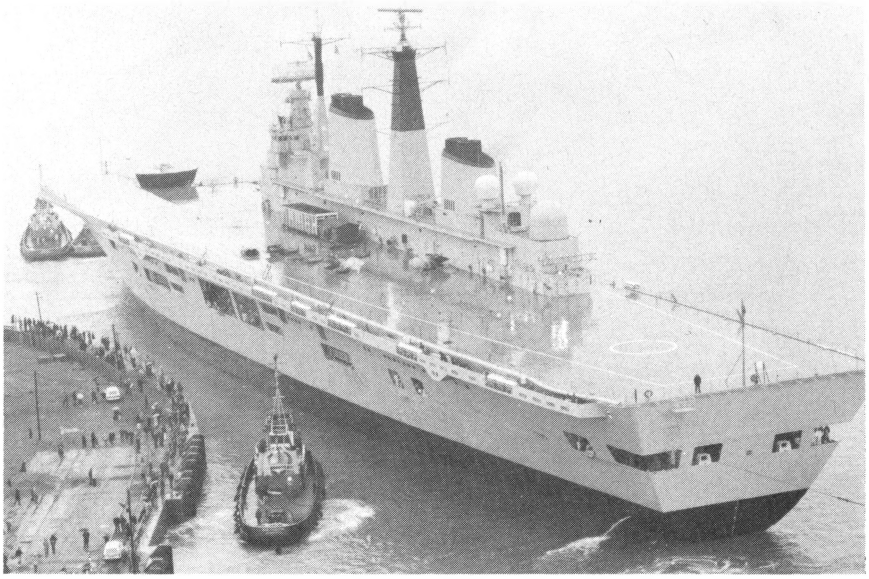
H.M.S. "Invincible"

First of a class of three anti-submarine cruisers ordered by the Royal Navy, H.M.S. "Invincible" (sixth ship of the name) was built by Vickers Shipbuilding Group Ltd. at Barrow-in-Furness. She started her sea trials on 26th March this year (when most of the pictures on this page were taken) and is due to enter service in the spring of 1980.

"Invincible" is powered by four Rolls-Royce Olympus gas turbines (marine adaptations of Concorde's engines) giving her a maximum speed of 28 knots and a range of 18 kt. of over 5,000 n. miles. Her principal dimensions are:

Length overall	209.6 metres
Length, waterline	192.8 metres
Breadth (flight deck)	31.9 metres
Draught	6.5 metres
Displacement, deep	19,810 tonnes

It is expected that her air group will initially comprise five Sea Harriers and ten Sea Kings.



Westland Sea King HAS.2 XV673 of No. 824 Squadron (when based in H.M.S. "Ark Royal" but now aboard R.F.A.s) lowers its dunking sonar to search for a submarine

New carriers . . .

folding may be possible to ease hangar stowage.

As for the Navy's future AEW capability—lost with the departure of the Gannet—an early go-ahead for a new fixed-wing V/STOL design for this role now seems urgent. Certainly, Britain cannot afford to wait until the Americans choose a suitable aircraft to meet their Navy's V/STOL-A requirement and develop that some time in the mid-1990s.

The possibility of employing helicopters for AEW has been examined by both the Royal Navy and U.S.N. in view of the considerable endurance of machines like the Sea King. Unfortunately helicopters are not ideal as platforms for AEW radar because their operational ceilings are too limited, due mainly to the problems of ice forming on their rotors at altitude, particularly in weather conditions frequently experienced in the North Atlantic.

As to the number of aircraft the new *Invincibles* could embark, it must be remembered that, although smaller than most of the Royal Navy's previous carriers, they are quite large vessels. With a length of 677 ft. and a beam of 105 ft., each ship will have overall dimensions similar to the great World War II battleships *Nelson* and *Rodney*. Only the two Super Powers have plans to build larger warships any more.

Initially *Invincible* will have an air group of five Sea Harriers (of No. 800 Squadron) and ten Sea Kings, but this should not be taken as a reflection of her true capacity. As more aircraft become available from British Aerospace, the Navy intends to increase the number of Sea Harriers in each squadron to eight. So *Invincible* should eventually embark up to eighteen aircraft, and these will be housed in her single hangar. Incidentally, in a break with normal Royal Navy practice, the hangar is not a regular box shape, but could be likened more to the shape of a dumbell.

Therefore, although they will not duplicate the outright offensive capability of their immediate predecessors, with the right assortment of V/STOL aircraft and helicopters the *Invincible*-class carriers should be able to defend airspace effectively, mount long-range strike and reconnaissance missions, and provide ASW and AEW cover for a task force. For example, from the mid-1980s *Invincible* might have an air group consisting of a squadron of eight Super Harriers, three AEW aircraft, and up to seven Westland WG.34s (Sea King replacements). This total could be slightly increased by employing a flight deck park while the ship is at sea.

As a fighter the Super Harrier might be armed with two 30-mm. Aden cannon under its fuselage and two AIM-9L Sidewinder dogfight missiles on the outer wing pylons, with two 100-gal. fuel tanks on the middle stations. This would leave the inner two pylons free to carry two Sky Flash medium-range missiles, which would increase the aircraft's effectiveness against supersonic targets like Russia's "Backfire" bomber.

Harrier VIFFing

Although subsonic, the Super Harrier's ability to VIFF (Vector In Forward Flight) would stand it in good stead in close combat against aircraft that have ostensibly more performance, as F-14 Tomcat pilots have already discovered when the present Harrier has been flown against them.

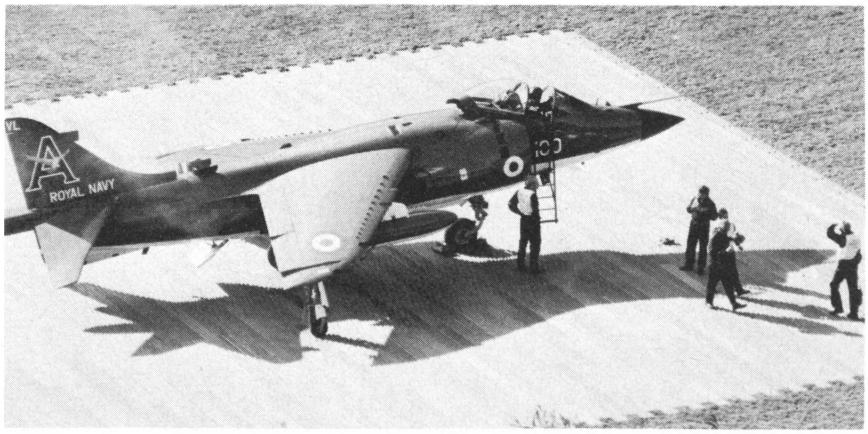
The Super Harrier's increased endurance over the present Sea Harrier will also make it easier to mount combat air patrols. Yet, with these aircraft being able to "scramble" in two minutes compared with eight for a carrier-based Phantom, an aircraft standing-by on deck may be all that is required from now on.

On strike missions, the Super Harrier's range advantage will be even greater, because it will not have to sacrifice its wing tanks to carry two P3T sea-skimming missiles. The P3T is an active-radar version of the Martel, powered by a turbojet, is transonic and has a range of 60 n. miles. Thus the aircraft will be able to stand-off beyond a target's air defences, but could still carry Sidewinders or ECM pods for self-defence against other aircraft.

To supplement the Super Harrier's anti-surface capability in an air group the WG.34 helicopter, equipped with a development of the Lynx's Sea Spray radar, will be able to carry the 9-mile-range Sea Skua missile. This weapon will be particularly useful in countering the threat from lightly defended targets such as missile-armed patrol boats.

The WG.34 will have three engines and may be able to loiter on only two during long patrols. For submarine protection the Navy has chosen initially to use sonobuoys instead of dunking sonar on the WG.34, unlike previous ASW helicopters. However, dunking sonar is not dead and may be applied to R.N. Lynx to increase their effectiveness

First Sea Harrier delivered to the Royal Navy was XZ451, seen outside the BBC's Pebble Mill Studio, Birmingham, when it appeared in a recent TV programme



New helicopter types which may be expected to see service in "Invincible" include the Westland Sea King HC.4 (Left) *and WG.34*

against the latest Soviet submarines, which can run more quietly and dive deeper than the earlier ones.

As well as their aircraft, the new carriers will be equipped with the most advanced command and communications facilities ever to go to sea in British warships. They will also be armed with Sea Dart missiles, which have a range of 50 n. miles, can engage aircraft and missiles, and have an anti-ship capability.

Unfortunately, in order to preserve the firing arcs of their Sea Dart launchers, the "Ski-jump" ramps on *Invincible* and *Illustrious* have been limited to 7 and 9 deg. respectively. On *Ark Royal* (and hopefully any subsequent ships of the class) the launcher will be resited to allow a 15-deg. ramp to be installed, and this may be fitted in her bows over that open forecastle—so she may have a full end-to-end flight deck. The first two ships will probably be modified to receive similar ramps when they go in for refit.

A particular advantage of the "Ski-jump" is the increased safety it affords for short take-offs in rough weather. This should help compensate for the fact that, at 20,000 tons, *Invincible* and her sister ships will have inferior seakeeping qualities compared with their larger predecessors (the fourth *Ark Royal* and *Eagle* displaced approx. 50,000 tons).

A major capability of the *Invincible*-class ships that was not shared by the older carriers, unless specially converted, is that they will be able to embark a Royal Marine Commando of 750 men and their equipment for amphibious warfare. These would be landed by assault helicopters (probably Sea King HC.4s) with V/STOL aircraft providing close air support.

Of course, while it is operationally desirable to deploy aircraft and large helicopters aboard purpose-built vessels, the Navy will be examining their deployment aboard ships other than the new carriers. All the new classes of destroyers and frigates have flight decks capable of accepting V/STOL aircraft, as do the Navy's amphibious assault and logistic support ships, and most R.F.A. tankers and stores ships.

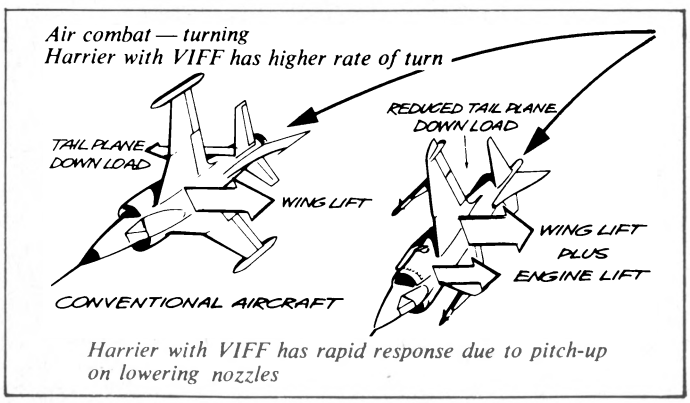
Container ships

One scheme the Royal Navy seems keen on is the idea of putting Sea Harriers and large ASW helicopters aboard modern container ships in times of national need. Fuel, ammunition, workshops, communications, and crew accommodation enough for a detachment of four aircraft would be built into standard-size containers. These containers would be hoisted aboard ship when required and a flight deck and "Ski-jump" would be assembled on the top container deck—perhaps made of the same medium girder units as were used at the Farnborough and Paris Air Shows.

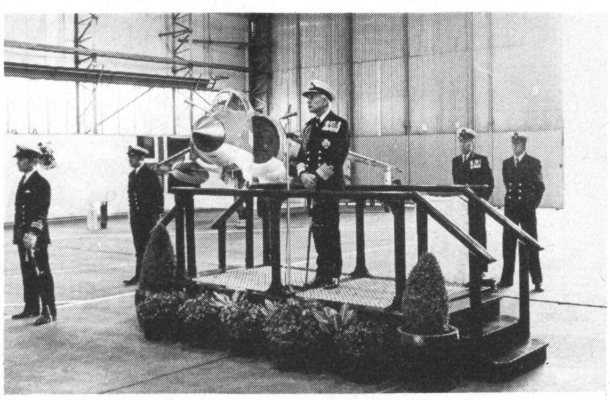
This scheme would seem to promise a major increase in the country's maritime air capability relatively inexpensively and rapidly in a crisis. Trials are planned aboard a chartered merchant ship, and these will be partly funded by the U.S. Navy, which is worried that the "Backfire" bomber threat in the North Atlantic could tie its attack carriers down to the role of convoy escorts in wartime.

Apart from their threat in the Atlantic, "Backfires", flying from air bases in Angola, Mozambique, or Somalia, are well placed to interrupt the vital Cape sea route, which is used by tankers carrying 80 per cent of the West's oil supplies. The arrival of Russia's first aircraft-carriers has also given the Soviet Navy a worldwide air strike capability, while the presence of Russian shipborne fighters could seriously threaten the previous invulnerability of Western long-range maritime patrol aircraft such as the Nimrod.

Certainly, maritime air power is as important to the West today as it has ever been. Now, with the demise of the British strike carrier force complete, V/STOL aviation is the only means the Royal Navy has of getting fixed-wing aircraft to sea in the foreseeable future. At last, with a Government in power that is pledged to restore our defences to an acceptable level, the Navy may be able to exploit the full potential of this new concept in maritime aviation.


Air combat — turning
Harrier with VIFF has higher rate of turn
TAIL PLANE DOWN LOAD
WING LIFT
CONVENTIONAL AIRCRAFT
REDUCED TAIL PLANE DOWN LOAD
WING LIFT PLUS ENGINE LIFT

Harrier with VIFF has rapid response due to pitch-up on lowering nozzles

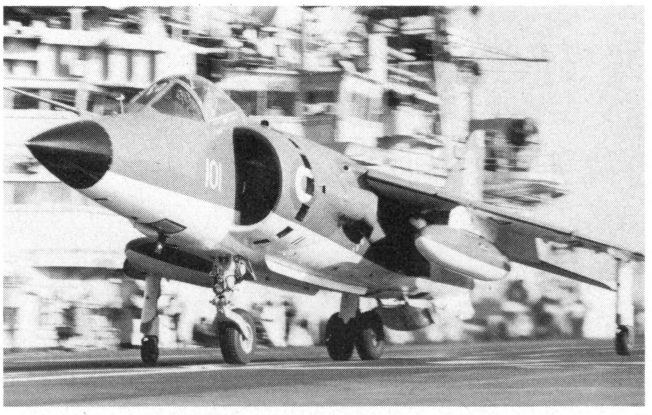


The scene at R.N.A.S. Yeovilton, 19th September, when the Navy's first Sea Harrier squadron, No. 700A, commissioned—with just one aircraft, XZ451

Sea Harriers aboard "Hermes"

FROM 24th OCTOBER to 8th November five British Aerospace (Hawker Siddeley) Sea Harrier FRS.1s carried out operational trials aboard the aircraft-carrier H.M.S. *Hermes* in the Irish Sea. Aircraft involved were: No. 700A Squadron's first two Sea Harriers, XZ451 coded "100" and XZ452 "101"; XZ439 from BAe Dunsfold; and XZ440 and XZ450, coded "40" and "50" respectively for the exercise, from A. & A.E.E. Boscombe Down. XZ450, which is Boscombe's systems aircraft, carried a gun pack and Sidewinder missiles in addition to long-range fuel tanks.

BAe's two-seat Harrier T.52 demonstrator G-VTOL/ZA250 also put in an appearance; and on the last day of the trials, 8th November, the Royal Navy took delivery of its third Sea Harrier at Yeovilton and the fourth R.N. aircraft made its first flight at Dunsfold. Frigate acting as plane-guard (see top photo) is H.M.S. *Euryalus*.



Airlines of the World

by GÜNTER G. ENDRES

Mexicana's fleet consists entirely of Boeing 727s—XA-TAC illus.

Compañía Mexicana de Aviacion S.A. (Flight code MX) Mexicana was founded in Tampico, Mexico on 20th August 1924. Original equipment consisted of four Lincoln Standard biplanes with which the new airline transported payrolls around the oil fields near Tampico. The first scheduled passenger service was inaugurated on 29th May 1928 between Mexico City and Tampico via Tuxpam.

The airline expanded rapidly and today carries over five million passengers annually with a large fleet of Boeing 727s. Apart from serving all important towns and cities within Mexico, the airline also flies to Los Angeles and San Francisco (California), Denver (Colorado). Dallas/Ft. Worth and San Antonio (Texas), Kansas City and St. Louis (Missouri), Chicago (Illinois) and Miami (Florida), all in the United States, as well as to San Juan (Puerto Rico), Havana (Cuba), Guatemala City (Guatemala) and San Jose (Costa Rica).

Head Office: P.O. Box 901, Balderas 36, Mexico 1, D.F. Telephone 585-24-22. Telex: 78870.

Reg'n.	*Type*	*c/n.*	*Previous identity*	*Names*
XA-CUB	Boeing 727-264/JATO	20709		"Tampico"
XA-CUE	Boeing 727-264/JATO	20710		"Guadalajara"
XA-CUN	Boeing 727-264/JATO	20780		"Oaxaca"
XA-DAT	Boeing 727-264/JATO	20787		"Merida"
XA-DUI	Boeing 727-264/JATO	20894		"San Jose del Cabo"/"Cabo San Lucas"
XA-DUJ	Boeing 727-264/JATO	20895		"Puerto Vallarta"
XA-DUK	Boeing 727-264/JATO	20896		"Cozumel"
XA-FID	Boeing 727-264/JATO	21071		"La Paz"
XA-FIE	Boeing 727-264/JATO	21072		"Cancun"
XA-GUU	Boeing 727-17	20328	N116TA	"Hermosillo"
XA-GUV	Boeing 727-17	20513	N117TA	"Guanajuato"
XA-HOH	Boeing 727-264	21577		"Tijuana"
XA-HON	Boeing 727-264	21617		"Mexico D.F."
XA-HOV	Boeing 727-264	21637		"Uxmal"
XA-HOX	Boeing 727-264	21638		"Palenque"
XA-IEU	Boeing 727-264	21836		"Tulum"
XA-IUP	Boeing 727-14	18910	N972PS	"Mitla"
XA-MEB	Boeing 727-264	21837		"Monte Alban"
XA-MEC	Boeing 727-264	21838		"Chichen Itza"
XA-MED	Boeing 727-264	22156		"Xochicalco"
XA-MEE	Boeing 727-264	22157		"Teotihuacan"
XA-MEF	Boeing 727-264	22158		"Malinalco"
XA-MEG	Boeing 727-77	18743	VH-RME	"Tajin"
XA-SEA	Boeing 727-14	18911	N973PS	"Acapulco"
XA-SEM	Boeing 727-64	19427		"Coatzacoalcas"/"Minatitlan"
XA-SEP	Boeing 727-14	18912	N974PS	"Villahermosa"
XA-SER	Boeing 727-14	18908	N970PS	"Veracruz"
XA-SEU	Boeing 727-14	18909	N971PS	"Tuxtla-Gutiérrez"
XA-SEW	Boeing 727-116	20217	N1780B	"Nuevo Laredo"
XA-TAA	Boeing 727-264/JATO	20432		"Mazatlan"
XA-TAB	Boeing 727-264/JATO	20433		"Monterrey"
XA-TAC	Boeing 727-264/JATO	20434		"Mexicali"
XA-TUY	Boeing 727-114	19815	N977PS	"Del Carmen"
N128NA*	Boeing 727-2J7	20879		"Ixtapa"/"Zihuateneio"
N129NA*	Boeing 727-2J7	20880		"Manzanilla"
N552NA*	Boeing 727-2J7	20706	OY-SBA	"Puebla"
N553NA*	Boeing 727-2J7	20707	OY-SBB	"Cuernavaca"

* Leased from NAL.

Mexicana has two Douglas DC-10-15s on order for delivery in 1981.

Pakistan International Airlines (PIA) (Flight code PK) Pakistan International Airlines was formed on 10th March 1955 from a merger of a government department (set up in 1951) with Orient Airways. Operations began with an international service from Karachi to London via Cairo and Rome, and a direct service between West Pakistan and East Pakistan (now Bangladesh). Fleet then consisted of fifteen piston-engined aircraft comprising Lockheed Super Constellations, Convair Twins and Douglas DC-3s.

Today a modern fleet of jets operates over an extensive network of services to thirty-five countries on four continents. As well as linking most major points in the Middle and Far East, PIA also flies to the U.S.A., Europe and Africa, serving New York, Athens, Amsterdam, Copenhagen, Frankfurt, Istanbul, London, Paris, Rome, Zurich, Cairo, Nairobi, Tripoli, Dar-es-Salaam, and Kilimanjaro. The airline's domestic services provide frequent connections to twenty-two destinations.

Head Office: PIA Building, Karachi Airport, Pakistan. Telephone: 412011. Telex: KAR-832.

Regn'n.	*Type*	*c/n.*	*Previous identity*
AP-ALN	Fokker F.27-200 Friendship	10164	PH-FCC
AP-ALW	Fokker F.27-200	10187	PH-FDB
AP-ATQ	Boeing 720-051B	18745	N68646
AP-ATU	Fokker F.27-200	10278	PH-FGV
AP-AUR	Fokker F.27-200	10307	PH-FKB
AP-AUX	Fokker F.27-200	10335	PH-FLF
AP-AWU	Boeing 707-373C	18991	N376WA
AP-AWY*	Boeing 707-340C	19866	YU-AGD
AP-AWZ	Boeing 707-340C	20275	G-AZPW
AP-AXA*	Boeing 707-340C	19286	YU-AGF
AP-AXB	Fokker F.27-200 Friendship	10288	I-ATIG
AP-AXC	Douglas DC-10-30	46931	
AP-AXD	Douglas DC-10-30	46940	
AP-AXE	Douglas DC-10-30	46935	
AP-AXF	Fokker F.27-400 Friendship	10354	OO-SCA
AP-AXG	Boeing 707-340C	20488	G-AZRO
AP-AXK	Boeing 720-047B	18590	N93150
AP-AXL	Boeing 720-047B	18818	N93152
AP-AXM	Boeing 720-047B	18749	N93151
AP-AYM	Douglas DC-10-30	47889	N19B
AP-AYV†	Boeing 747-282B	20928	CS-TJC
AP-AYW†	Boeing 747-282B	21035	CS-TJD
AP-AZP	Boeing 720-030B	18250	JY-ADS
AP-AZW	Boeing 707-351B	19636	N380US
AP-BAA	Boeing 707-351B	19635	N379US
AP-BAF	Boeing 720-047B	18589	N93149
AP-BAK	Boeing 747-240B	21825	
AP-BAL	Fokker F.27-200 Friendship	10243	F-BUFE

* Cargo aircraft.

† Leased from Air Portugal.

Four A300B4 Airbuses are on order for delivery in 1980.

Pakistan International's largest type is the Boeing 747 (AP-AYV shown Left) *and smallest, the Fokker F.27 Friendship* (AP-ALW)

View of Kai Tak's 11,300-ft. runway, looking out across the harbour, from the control tower

Visit to Hong Kong

by DAVID OLIVER *[Author's photos mostly]*

MY BRITISH Airways Boeing 747, G-AWNA, let down over Cheung Chau Island near the end of Flight BA003 from London to Hong Kong, and prepared to enter the "approach funnel" for Kai Tak's runway 13—one of the most exciting or hair-raising, depending on your point of view, final approaches to an international airport anywhere in the world.

The curving descent takes the airliner literally between, and often below, the high-rise buildings of Kowloon, past a 300-ft. high tower situated only 500 yards from the flight path two miles from touch-down. The climb-outs from the opposite end of Kai Tak's single runway are equally demanding for the pilots and air traffic controllers.

The reason for Kai Tak's difficult approaches are the series of hills to the north of the airport which are in a direct line with the runway, starting with the 1,512-ft. Beacon Hill only two miles away, ending with the 3,187-ft. Tai Mo Shan Peak six miles out, which precludes all straight-in approaches to runway 13.

However, this was not a problem when Kai Tak started life as a dirt strip in 1927, built on one of the few relatively flat pieces of ground that had not been built on, and alongside a busy seaplane base. After the Japanese invaded the Colony on Christmas Day 1941, with only a flight of Vickers Vildebeest IVs, a couple of Tiger Moth Is and Walrus left in Hong Kong to oppose them, they laid down two runways, after first demolishing part of the old walled City of Kowloon to provide the room and the building materials.

The first aircraft to use Kai Tak after the Japanese surrender in August 1945 were Spitfire XIVs of No. 132 Squadron, R.A.F., and with the defeat of the Nationalist Chinese Forces by the Communists in 1949, the "Spits" were followed by many others, including No. 133 Squadron with Tempest IIs, Nos. 28 and 80 Squadrons with Spitfires, Dakotas of No. 110 Squadron, and Sunderlands of No. 209 Squadron. Soon after that emergency, No. 28 Squadron, which is still based in Hong Kong after thirty years' continuous service in the Colony, was equipped with D.H. Vampire FB.5s, the first jets to be stationed at Kai Tak. Not long after that Kai Tak once again became a busy staging post for the R.A.F. during the Korean War.

During the last two decades, however, the border tension with China has eased and at the time of my visit there were no R.A.F. units based at Kai Tak, although some R.A.F. aircraft were to be seen, including a Vulcan, a VC10 and a Canberra PR.9.

Kai Tak's importance

Kai Tak is now one of the busiest international airports in the Far East with nearly 3,000 flights a week, and due to its importance as a centre of trade and commerce in the area, it is on most of the world's leading airlines' schedules.

In 1956 an 8,350-ft. runway was built extending out into the harbour—the only place it could go—this was further extended to its present length of 11,300 ft. in 1973. The terminal buildings and control towers have been continually modernised and added to over the years, and Kai Tak has now been developed as far as it can be.

Kai Tak is the home base for Hong Kong's own Cathay Pacific Airways, which has grown with the airport since

Left: *Cathay Pacific Lockheed TriStar and Air France Boeing 747 Freighter seen from British Airways Boeing 747 G-AWNA as it landed at Kai Tak with the author aboard.* Right: *Malaysian Airline System McDonnell Douglas DC-10-30 9M-MAS loading at Kai Tak's pier*

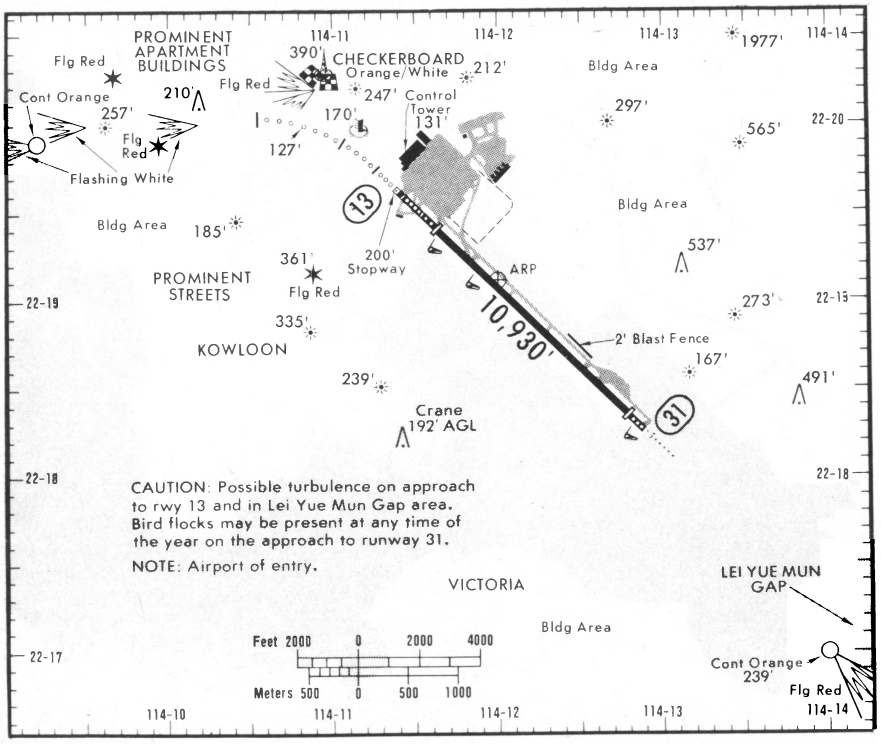
it was formed in 1948, and now operates nine Boeing 707-320s and five Lockheed TriStar 100s. In fact, a large proportion of the aircraft seen at Kai Tak in 1979 are wide-bodied jets, including a number of A300s belonging to Korean Air Lines, Malaysian Airline System, and Thai Airways International.

During my visit I saw a selection of all-cargo aircraft including an Air France Boeing 747-200F, a Flying Tiger Lines Boeing 747-100F, Seaboard World Airlines DC-8-16CF, and Transmeridian Air Cargo's Hong Kong-registered Canadair CL-44D VR-HHC.

As well as being an important cargo terminal, Kai Tak is the base for the Hong Kong Aircraft Engineering Company, one of the oldest and most experienced aircraft engineering firms in the Far East. It is owned by the giant Swire Group that also owns a large share of Cathay Pacific Airways and whose slogan is that they work on every type of aircraft "from the Tiger

(continued overleaf)

Cathay Pacific TriStar VR-HHK climbing out of Kai Tak (Photo: Cathay Pacific Airways)



Above: *Kai Tak's modern control tower*
Left: *Chart showing the approaches to Hong Kong's International Airport at Kai Tak (Copyright: Jeppesen & Co. 1979)*

Left: *Korean Air Lines A300B4 Airbus HL7238 seen through Kai Tak's double security fence.* Right: *Army Air Corps Westland Scout AH.1 XP643 of No. 660 Squadron picking up VIPs at the old Hong Kong Air heliport at Harcourt Road, Hong Kong Island*

Left: *A R. Hong Kong Aux. A. F. Scottish Aviation Bulldog 128, serial HKG 5, at Sek Kong.* Right: *Dave Baker's Tiger Moth, T6645, flying over the New Territories in company with the Army's last operational Westland Sioux, XT546*

Hong Kong . . .

Moth to the Concorde''—and they have.

Kai Tak is also the base of the Royal Hong Kong Auxiliary Air Force, a volunteer force equipped with three Aérospatiale Alouette III helicopters used for SAR, liaison and policing, a Britten-Norman Islander for survey work and anti-smuggling patrols, and two Scottish Aviation Bulldog 128s and a Beechcraft Musketeer which are used for training. The R.H.K. Aux. A.F.'s twenty part-time pilots serve a four-year tour, have a New Zealand C.O., and an R.A.F. QFI is attached to the unit for a 2½-year tour.

In the north-west corner of the airport there is a collection of some of Kai Tak's oldest buildings, including a small hangar belonging to the Far East Flying and Technical School Ltd., which houses an ex-R. Malaysian A.F. D.H. Canada Chipmunk T.10 (VR-HGE), a Bell 47, and an ex-R.H.K. Aux. A.F. Auster AOP.6 and Beech Musketeer. These aircraft are used as instructional airframes by the School's students and have been grounded for some years.

Alongside in a wired-in compound are the hangars, aircraft park and club houses of Hong Kong's two flying clubs—the Aero Club and the Hong Kong Flying Club. The latter was formed in 1964, equipped with a single Musketeer (VR-HFU) which is still giving the club good service some fifteen years later. This was followed by the Chipmunk (VR-HGE) in 1968 and a Beagle Pup 150 (VR-HGZ) which was written off after a crash in the New Territories in September 1978. The club was looking for a suitable replacement when I visited it. Its close neighbour, the Aero Club, has two Cessna 152s (VR-HHN and VR-HHP).

Due to the many restrictions on private flying in the Colony, and flying training in particular, the most serious of which was the Authorities' decision late last year to prohibit all solo student flying at Kai Tak, the two clubs have combined their training activities in the hope that their protests will carry more weight. However, one should bear in mind the fact that if a Boeing 747 is forced to overshoot Kai Tak's single runway due to a hesitant student pilot being slow to clear the runway, the 747 will have to fly a circuit of at least 30 miles, which can be expensive to the airline and disruptive to Kai Tak's busy schedules.

At the time of my visit there were a number of privately owned aircraft to be seen in the club's compound, including Cessna 340 VR-HHA, Beagle Pup 100 VR-HGT, Australian Cessna 206 VH-BEF, and an unmarked Fuji 200 that was being rebuilt after a heavy landing. One of the club members owns a Stearman Kaydet, but no one was sure of its exact whereabouts.

It has been obvious for some years that Kai Tak has reached the end of its development—and that a site for a new airport must be found. After much searching and debate, it has been decided that Hong Kong's new international airport will be built on Lamma Island, some two miles west of Hong Kong Island, which has the twin advantages of being reasonably flat and undeveloped. However, the details of when the new airport will be built are a long way from being settled, and in the meantime all student flying has been transferred to the only other airfield in the Colony at Sek Kong.

Sek Kong

Sek Kong is situated in the centre of the New Territories of Hong Kong only four miles from the Chinese border, and was first used by the Army's Austers, along with Sha Tin which is now Hong Kong's largest race-course, in the early 1950s. In 1952 proper runways were laid down, and Sek Kong became the base for No. 28 Squadron's Vampire FB.9s, but as the end of the runway was only two miles from the Colony's highest peak, the 3,187-ft. Tai Mo Shan, it was declared too dangerous for modern jet fighters in 1957, and since that time it has been a helicopter base.

Sek Kong's present occupants are an Army Air Corps Unit that began life as No. 656 Squadron at Sek Kong in 1958, which for some reason became No. 11 Flight in 1977 and was reclassified as No. 660 Squadron in August 1978. No. 660 is equipped with nine Westland Scout AH.1s, six based in Hong Kong and three in Borneo, and until November

R. Hong Kong Aux. A.F. types at Sek Kong (left to right): Bulldogs HKG 5 and 6, Beech Musketeer HKG 4 and B-N Islander HKG 7

1978 flew the Army's last operational Sioux AH.1 (XT546).

The Army unit was joined at Sek Kong in the spring of 1978 by Hong Kong's own R.A.F. squadron, No. 28, with its long-serving Westland Wessex HC.2s. Both units are engaged in local security and Army support duties, the Army Scouts being used for illegal immigrant searches and VIP flights, and the Wessex for search and rescue.

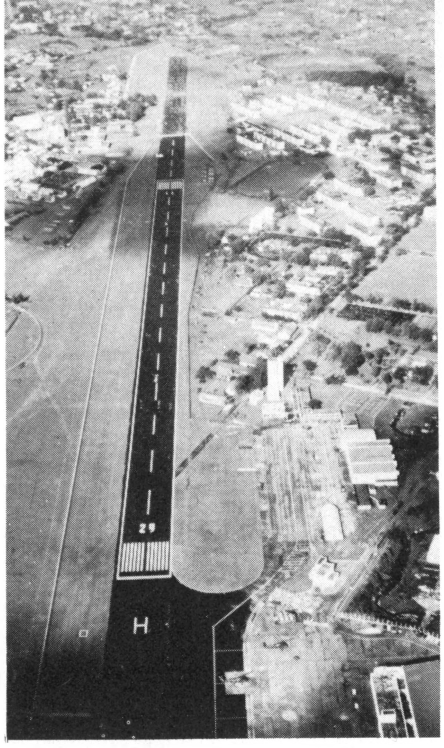
Sek Kong is also used by the R.H.K. Aux. A.F. for training flights and a two-week annual camp, when the aircrews manage to capture some of the relaxed atmosphere of our own Royal Auxiliary Air Force summer camps of the 1930s.

One of the more unusual residents of Sek Kong is an immaculate Tiger Moth (T6645) belonging to one of Cathay Pacific's TriStar Captains —Dave Baker, who recently shipped the Tiger Moth from the U.K. and had it completely rebuilt by the Hong Kong Aircraft Engineering Co., at Kai Tak. It now shares one of No. 660 Squadron's hangars with the Scouts, and every now and again, the soldiers and the local Chinese living around Sek Kong, are treated to the sight of a Tiger Moth aerobatting over the airfield as Dave Baker puts it through its paces.

One such occasion was Sek Kong's annual air display when, as well as the Scouts and Tiger Moth, participants included an R.A.F. Vulcan and a Canberra PR.9 from No. 39 Squadron, whose full-throttle climb-away from the airfield with Tai Mo Shan Peak in its path, made one appreciate the problems of operating jet aircraft from Sek Kong.

Apart from Kai Tak and Sek Kong, the only other landing ground in the Colony is the old Hong Kong Air helipad at Harcourt Road on Hong Kong Island. It is still used occasionally by the Army and R.A.F. to pick up VIPs but its days are numbered as it is due to be built on in the near future.

The reason for the failure of the once-thriving Hong Kong Air, which operated a fleet of Alouette IIIs, Bell 47Js and 212s until a few years ago, was the cheapness and efficiency of the many ferries that ply the Hong Kong waterways, and the new road tunnel built under the harbour to connect the Island with the mainland.



Top Left: *Two Westland Wessex HC.2s of No. 28 Squadron, R.A.F., climb away from Sek Kong towards the Tai Mo Shan peak.* Bottom Left: *Two Army Scout AH.1s of No. 660 Squadron with Sek Kong's control tower behind.* Right: *Sek Kong airfield*

However, a new helicopter service from Hong Kong to Macau, 40 miles to the south-west of the Colony, is scheduled to begin shortly. It will be operated by the Far East Ferry Co., who have one of the largest fleets of Boeing Jetfoils in the world, on the Hong Kong–Macau route, using an Aérospatiale SA.330F Puma. Permission for this route has been obtained from the Chinese Government who control the airspace between Hong Kong and Macau, and this decision is indicative of the rapidly improving relationship between the Chinese and the Colony. After some experimental cargo flights from Canton to Kai Tak, the Chinese Government announced that their airline, CAAC, would begin scheduled flights to the Colony from Hangchow and Nanking, probably using Ilyushin Il-18s or Vickers Viscounts.

So with the possibility of a new airport being built in Hong Kong in the next few years, and that the Colony may well become the world's aerial gateway to Communist China, aircraft in Hong Kong will soon rival its population as being one of the most crowded countries in the world.

Acknowledgments.—I would like to thank Mr. H. L. Ko of the Hong Kong Civil Aviation Department, and Captain J. D. Llewelyn Davies of No. 660 Squadron, Army Air Corps, for their time and assistance during my visit to Kai Tak and Sek Kong.

The Far East Flying & Technical School's hangar at Kai Tak with the School's Beech Musketeer in the foreground

An Aero Club Cessna 152, VR-HHN, outside the club house at Kai Tak with, behind, a Fuji FA200 which is being rebuilt

Dear Sir . . .

Letters and photos of general interest are welcome and will be considered for publication—but they should be kept as short as possible. Will readers requiring acknowledgment of their letters please enclose a stamped addressed envelope.

Strike carriers

I was most gratified to see that *Air Pictorial* recently picked up the story of the big new ships under construction in the U.S.S.R. (October issue, page 377). For many years now you have been the only section of the British media to report consistently on the ever-increasing importance of maritime air power. I am sure that you must agree that it is really becoming more and more difficult not to fall into the trap of using the offensive comment "Told you so" when discussing this subject.

Politicians and Press have spent millions of words celebrating the end of the aircraft-carrier and yet the U.S.A. and U.K. are still building them (phoenix-like in the latter case), Australia is looking for a new one, and the Russians are pressing ahead with great urgency. After a few years with her outsize helicopter-carriers Russia is now building what seems certain to be a fleet of strike carriers. Let us not be in doubt—when these ships appear on the open oceans they will have a far greater politico-military impact than did the advent of the nuclear submarine.

When thinking about the tremendous power and versatility of the strike carrier it is as well to take a parallel look at current affairs in the field of politics-cum-strategy. Here too the Russians are making rapid progress. Their friends the Cubans, as a proxy-Soviet Army, are all over large areas of Africa. The much-scorned Domino Theory in South-East Asia continues to come true. The West Indian islands are going Marxist one by one, together with areas of Central America. Russia has an iron fist thrust into the guts of Afghanistan and Eritrea, both of them stepping stones to Arab oil. In all these areas Soviet interest is supposed to be in the people—it is not: it is in power, the power to obtain oil and raw materials. Here too lies a clue to all the propaganda that goes on against the Governments of South Africa and Rhodesia. Every day as it comes pouring over the air one cannot help wondering just where it all comes from!

Looking towards Europe I find it unnerving to hear top men indulging in wild talk about the imminent risk of a rapid thrust by Russia through Germany. These seem to be phoney fears expressed illegitimately with the aim of securing bigger air forces and armies. Remember the Maginot Line! So long as we keep up our guard the likelihood of a central thrust by Russia, or of attacks on the U.K. by Russian bombers, must be minimal since it must lead inevitably and rapidly to nuclear retaliation.

Whether it suits or not we must take a new look at our NATO strategy. Have we not been deluded into putting our maximum effort into defences in Western Europe and the Atlantic? (We were certainly fooled into giving up our strike carriers.) Is there not now a threat of conflict, just as serious as the position in Europe, in the Western Indian Ocean and South Africa?

Taking the broad picture, aircraft are still the dominant weapon system yet devised by man. Likewise, since defensive skills and technology have progressed just as fast as the offensive ones, the aircraft-carrier remains an authentic method of carrying air power to the right place. In the narrower picture, what could be more essential an element of defence and offence than a strike carrier force between Karachi, Cape Town and Freetown? If Russia deploys carriers in that part of the world with an offensive aim, the only counter short of nuclear war will be another carrier force.

In 1939 a lot of people were to be heard saying "Told you so!" We had better not throw away our ninth life by allowing a similar cause for criticism to become valid in the next few years.—*Captain G. C. Baldwin, C.B.E., D.S.C., R.N.(ret'd.), Chichester, Sussex.*

Greenham Common's Photobus

Referring to J. D. R. Rawlings' request for a "Popemobile" at air displays (November issue, page 417), have you not heard of the "Photobus" operation of the International Air Tattoo at Greenham Common?

Open-top double-decker buses are used to transport enthusiasts, particularly photographers, around the flight line normally not open to the public for safety reasons (jet blast, etc.). More than 3,000 people per Tattoo have used the "Photobus" since its inception in 1976, and the number of buses used is on the increase. They'll be there in 1981, the next International Air Tattoo, at which a number of surprises are planned.—*Kit Townend, Publicity Manager, International Air Tattoo, Greenham Common, Newbury, Berks.*

Rhodesia in the early days

I was most interested and very pleased to see the article on Air Rhodesia by Ken F. Smy in your October issue.

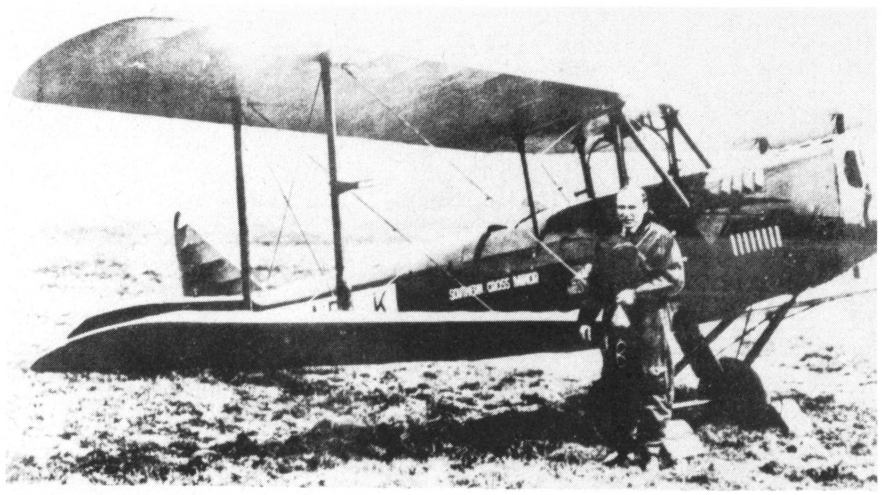
It revived many memories to me of Tom Spencer who operated a small charter service from the Falls in the pre-war era. He was a legend in that part of Africa when one's life in the air depended upon intimate knowledge of a vast and often hostile terrain, experience in operating from small, high and very hot grass or sand strips and resourcefulness when things went wrong.

I first met Tom Spencer in the 1930s when my father and I were looking for herds of wild life to photograph from the air. He pointed to a blank spot on the map towards the Belgian Congo and said, "That's where you'll find them, they have not yet been reached by man, black or white."

We flew on a compass course for 300 miles way beyond the outpost of Mongu and, sure enough, there across a vast plain that opened up from the Zambesi swamps, stampeded enormous herds of practically every variety of wildlife in Africa, disturbed bewilderingly by the sound of our Gipsy engine overhead.

Although we knew Africa fairly well by that time, we were astonished as thousands upon thousands of hoofs thundered above the noise of our engine as we manoeuvred for good "shots"

Following the article on "Southern Cross Minor" in our July issue, we have received this photo of Avro Avian Mk. V G-ABLK with Capt. Bill Lancaster in front—from D. R. Neate of Devizes who got it from Jim Prendergast in Australia



Forerunners of the "Popemobile"? Two "Photobuses" trundle through the flight-line during the 1977 International Air Tattoo, Greenham

in between the clouds of dust coming up from the sun-baked plain. Never in Angola, Kenya, Sudan, Mozambique or anywhere else had we seen anything like it and only the knowledge that we had 300 miles of compass flying back to civilisation forced our eyes from the remarkable scene below us.

Tom Spencer was well known for his trips by air into the "blue". He knew that part of Africa better than any man, of that period, I ever met. He also had a sound knowledge of the native tribes over a large area. It was common for him to go off on a compass course, search a remote area from the air and then using his considerable ability and experience, land beside a native village that may never have seen a white man before.

He was so typical of the many Northern and Southern Rhodesians I came to admire, respect and often develop a deep and lasting affection for.

His death just after the last war probably ended an era that will never be known again. I am sure all his friends who are still alive will remember his contribution to a harsh land that he, with others of his kind, were taming for the benefit of mankind both black and white.—*Alex. Henshaw, Sutton-on-Sea, Lincs.*

R.A.F. Northolt

Northolt, the R.A.F.'s oldest operational airfield, has seen almost 65 years of continuous flying since opening in March 1915.

In co-operation with the station historian, F/Lt. Barry Nicolle of No. 32 Squadron (currently based along with No. 207 Squadron and flying a mixture of Devons, Andovers, HS 125s and Whirlwinds in the communications role), I am researching into the history of this famous airfield and would be interested to hear from anyone who has ever served at Northolt either in a military or civilian capacity.

Next year, 1980, is the 40th anniversary of the Battle of Britain and a reunion of air and ground crew is planned at Northolt in September. All personnel who served during this period are invited to contact F/Lt. Nicolle at Northolt either by letter or by telephone (01-845 2300, Ext. 325).—*Peter A. Norris, 7 Precinct Road, Hayes, Middlesex UB3 3AG.*

Oshkosh winners

I made an unfortunate assumption in captioning the Waco ZPF-7 (November issue, page 436). It was not the Grand Champion Antique, but appeared to have been put in a position of honour and as the results had not been announced before I left, I guessed that it was being honoured because of the award (it certainly deserved one!). The actual Champion was a Howard DGA-15P, NC22416, owned by Dick Martin from Green Bay, Wisconsin. A photo of this is enclosed.

Other trophy winners at Oshkosh were: Custom (Home-Built)—VariEze C-GVEZ from Victoria, B.C., Canada; Rotorcraft—Glanville Skymaster C-GRKV, from St. Thomas, Ontario, Canada; Classic—Luscombe 8E N2132B from Woodland, California; and Warbird—Grumman FM-2 Wildcat N18P from Hillside, Illinois.—*J. M. G. Gradidge, Rickmansworth, Herts.*

Air Rhodesia

I was very interested in the article on Air Rhodesia in the October issue, but would like to correct the caption to my photograph of Dakota ZS-DDC. Actually it was photographed at Bulawayo/Kumalo on 30th December 1951. Kumalo was the airport for Bulawayo until the late 1950s.

Two other small errors in the tables for the C.A.A. fleet: Rapide VP-YCK became VP-RCI; and Viking VP-YIR became G-AHPH.—*D. F. Gilpin, Newton Abbot, Devon.*

Winner of the Grand Champion Antique award at Oshkosh 1979 was this Howard DGA-15P, NC22416, owned by Dick Martin (Photo: J. M. G. Gradidge)

Light Aeroplane Design Competition

VISITORS TO this year's Business and Light Aviation Show, organised by *Flight International* and held at Cranfield on 6th–8th September, must have been gratified to see the large number and variety of aircraft that turned up, including more than seventy from other parts of Europe. Flying was confined mainly to customer demonstrations and in almost perfect weather activity was brisk; some 800 aircraft movements were recorded on each of the first two days of the show and 750 on the last. One observer estimated that there were about 500 aircraft on the field at any one time.

One of the nice things about Cranfield is that, within reason, visitors are free to walk among the aircraft and examine them in detail. Those who wandered a bit further, into the Sir Stafford Cripps Hall of the Cranfield College of Technology, will have had a foretaste of the future—for there, in a display organised by the Royal Aeronautical Society's Light Aeroplane Group, were entries for the Group's Light Aeroplane Design Competition.

Although final judging of the competition is not due to take place until after 31st December, ten entries have already been selected as the most promising of all those received. Thanks to Tim Wrixon, Editor of the Society's magazine *Aerospace*, we are able to reproduce here drawings of these ten aircraft designs, together with brief specifications.

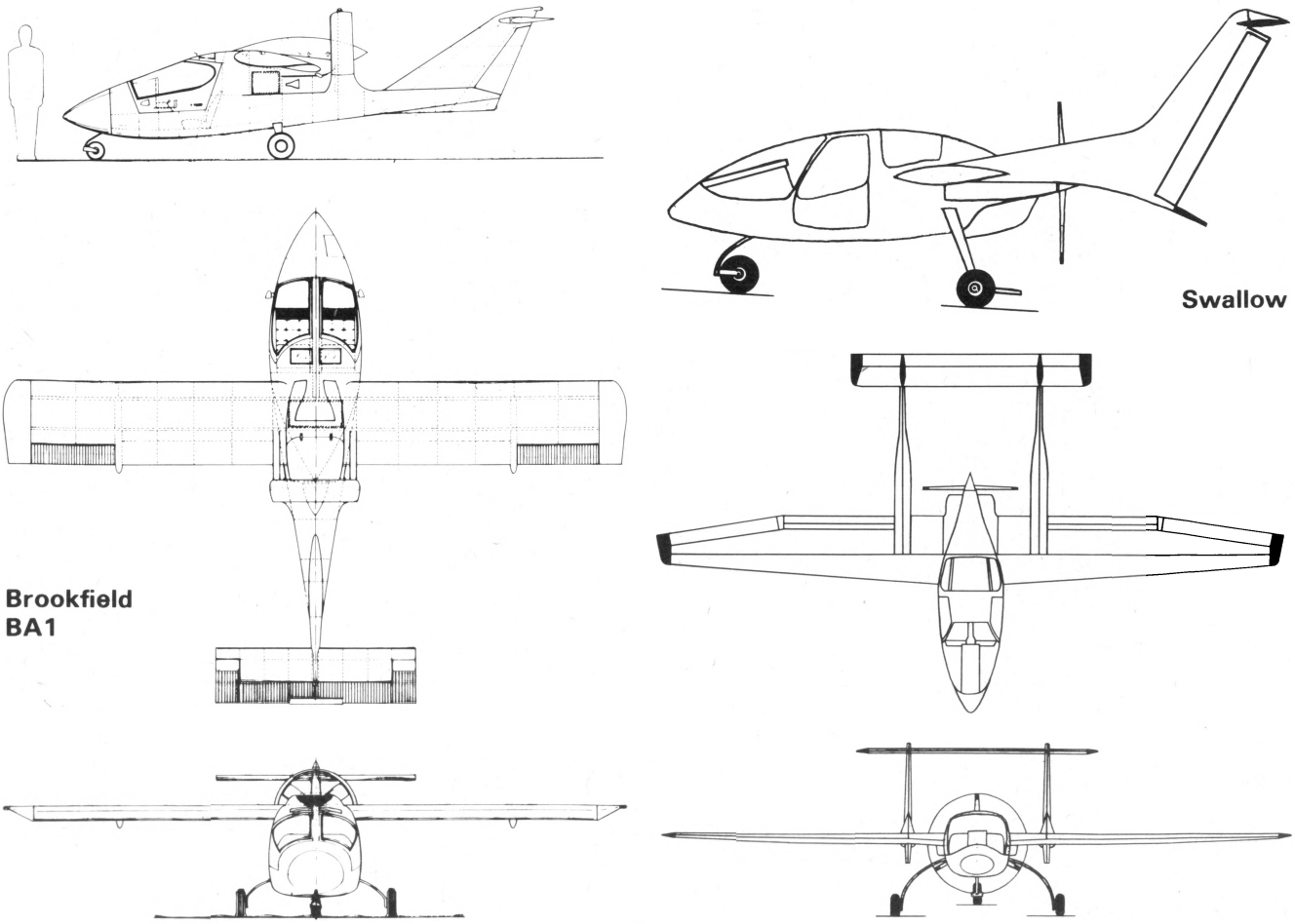
Entrants were asked to submit general arrangement drawings of their designs and be prepared to give a short description of their aircraft's features and background development at the meeting in the Sir Stafford Cripps Hall. Each entrant (one of the ten was unable to be present) was allowed 8 or 9 minutes for his talk and a few more minutes to answer questions. It seems likely that each designer gained useful tips from the better points of other competitors' designs, and it may be that the final designs will be somewhat different from those illustrated here.

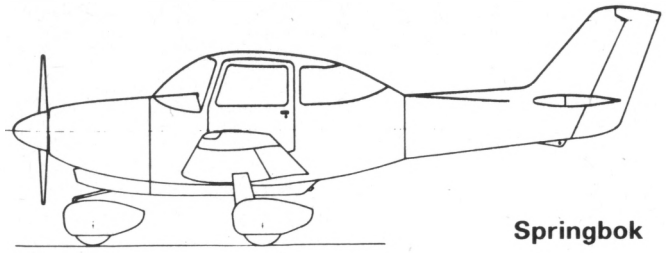
In two cases entrants submitted alternative designs on the same theme: the Polaris Type 1A with fixed landing gear and 115-h.p. engine and the Polaris Type 1B with 160-h.p. engine and retractable undercarriage; the Kite 2 trainer with 130-h.p. engine and the more powerful (210-h.p.) Kite 4 which is intended for use as a tug as well as a tourer. Not all entrants provided the same amount of data, nor always in the same units, but all that was revealed is shown in the table of specifications.

Owing to space limitations we have, for the most part, reproduced only the side views of the aircraft and trust that these give a reasonable idea of their general layouts; it should be noted, however, that the two Polaris designs have swept-forward wings. In two cases, the Brookfield BA1 and the Swallow, we have included three-views as these designs have several unorthodox features, notably the shrouded pusher propeller of the Brookfield (which ought to prove a quiet aircraft) and the twin-boom layout of the Swallow which has an unusually high aspect ratio wing while the booms appear to have been shaped to give extra fin area, with tall rudders, to compensate for their short length.

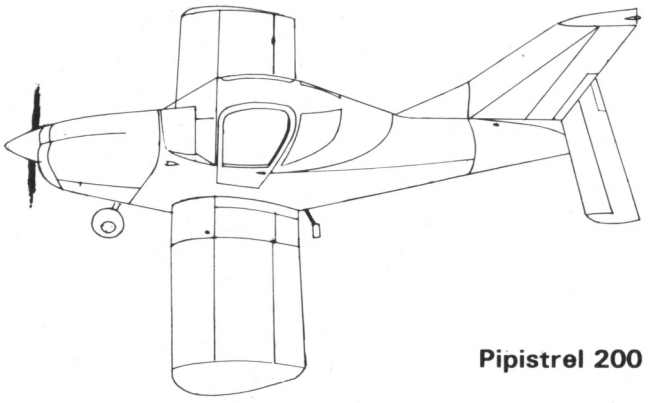
In view of the great interest already aroused by the competition, it is to be hoped that the winning design will eventually go into production.

G.A.s of two of the more unusual entries. All the drawings on these two pages are by courtesy of "Aerospace", magazine of the R.Ae.S.

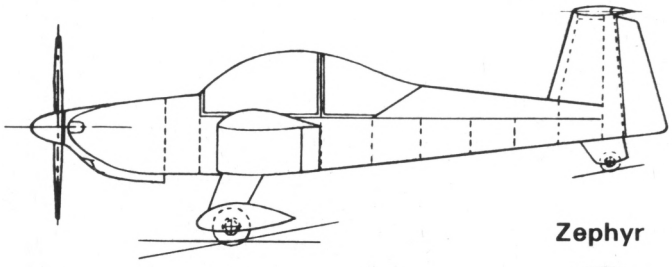




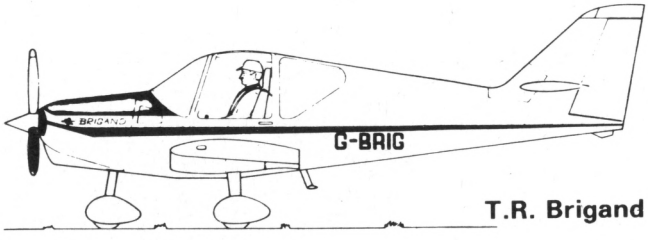
Springbok



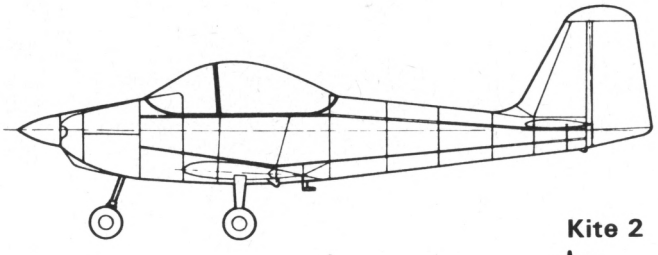
Pipistrel 200



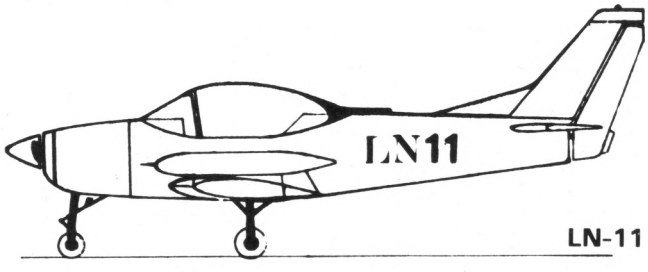
Zephyr



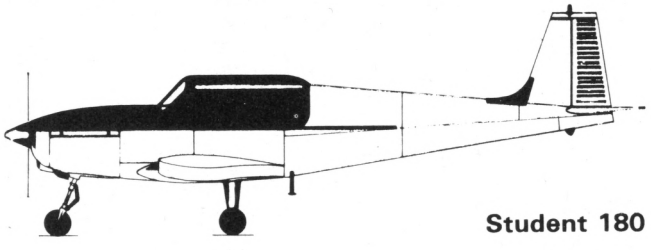
T.R. Brigand



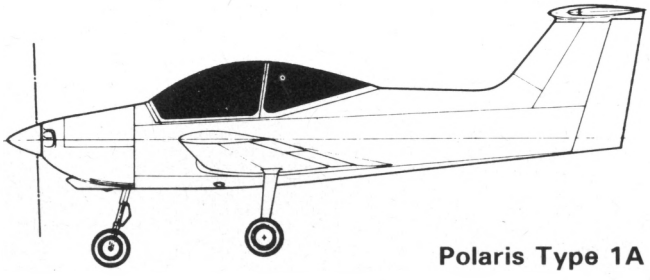
Kite 2



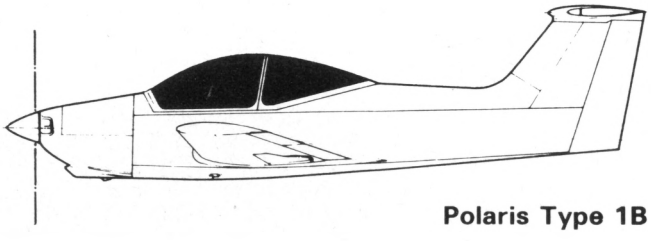
LN-11



Student 180



Polaris Type 1A



Polaris Type 1B

LIGHT AEROPLANE SPECIFICATIONS

	Brookfield BA1	*Kite 2**	*LN-11*	*Pipistrel 200*	*Polaris Type 1B†*	*Springbok*	*Student 180*	*Swallow*	*T.R. Brigand*	*Zephyr*
Type	Aerobatic general purpose	Trainer	Trainer	Aerobatic club/trainer	Utility aerobatic	Light cross-country-trainer	Trainer	Aerobatic trainer	Trainer	Trainer
Powerplant	120-h.p. Rolls-Royce O-240	130-h.p. Rolls-Royce O-240	100-h.p. Continental O-200A	130-h.p. Rolls-Royce O-240	160-h.p. Lycoming O-235-D	145-h.p. type unspecified	180-h.p. Lycoming O-360-A5AD	100/200-h.p. type unspecified	100-h.p. Rolls-Royce O-240A	120-h.p. Rolls-Royce O-240
Span	30 ft.	30 ft.	25 ft. 5 in. (less tip tanks)	28 ft. 6 in.	28 ft. 8 in.	27·9 ft.	26 ft.	37·73 ft.	26 ft.	30 ft. 10 in.
Length	22 ft. 3 in.	23·8 ft.	22 ft.	23 ft. 2 in.	19 ft. 8 in.	n.a.	26 ft.	22 ft.	23·12 ft.	21 ft. 1½ in.
Height	7 ft. 6 in.	n.a.	8 ft. 6 in.	9 ft. 6 in.	6 ft. 11 in.	n.a.	9·5 ft.	10 ft.	8·12 ft.	7 ft. 10 in.
Wing area	112·5 sq. ft.	n.a.	104 sq. ft.	130 sq. ft.	115 sq. ft.	90·4 sq. ft.	121·5 sq. ft.	126 sq. ft.	124·5 sq. ft.	102 sq. ft.
All-up weight	1,475 lb.	1,700 lb.	1,600 lb.	1,525 lb.	1,525 lb.	1,571 lb.	2,150 lb.	1,985 lb.	1,700 lb.	1,457 lb.
Empty weight	915 lb.	n.a.	922 lb.	855 lb.	906 lb.	925 lb.	1,229 lb.	1,000 lb. approx.	950 lb.	n.a.
Maximum speed	150 m.p.h.	n.a.	140 m.p.h.	n.a.	178 kt.	155 kt.	120 kt.	130 kt.	159 m.p.h.	137 kt.
Cruise	121 m.p.h.	138 m.p.h.	120 m.p.h.	136 kt.	154 kt.	148 kt.	n.a.	120 kt.	140 m.p.h.	n.a.
Climb rate	860 ft./min.	1,000 ft./min.	700 ft./min.	1,000 ft./min.	2,000 ft./min.	n.a.	1,250 ft./min.	700 ft./min.	800 ft./min.	1,500 ft./min.
Stalling speed (full flap)	n.a.	n.a.	60 m.p.h.	29 kt.	47 kt.	49·7 kt.	n.a.	50 kt.	55 m.p.h.	44 kt.
Range	430 miles	620 miles	n.a.	865 miles	750 miles	414 naut. miles	500 naut. miles	n.a.	700 miles	n.a.

Note: Units are those chosen by the designers, some preferring knots to m.p.h., etc.; n.a. equals not available.

* Kite 4, an alternative cruiser-tug version, has a 210-h.p. Rolls-Royce IO-360 and cruising speed of 170 m.p.h.

† Polaris Type 1A, alternative version, has a fixed tricycle undercarriage, 115-h.p. Lycoming O-235-C and maximum speed of 139 kt

Gloster Gladiator I of No. 615 Squadron, Aux. A.F., at dispersal at Croydon, September 1939, near Roundshaw Park/Foresters Drive (Author's photos)

Worm's Eye View

Part 2: Croydon at the outbreak of World War II

by BRIAN HAIMES

AROUND THE beginning of August 1939 S/Ldr. Fox, in charge of the Air Defence Cadets at Croydon, who undoubtedly knew more than he was letting on, proposed that a detachment of cadets might be able to do useful work on the aerodrome, especially if there was going to be a war. I thought that a wonderful idea, even if it only meant acting as messenger boys. I found myself N.C.O. in charge of the aerodrome detachment.

On the aerodrome there was little to indicate that war was looming. There were, however, rather a lot of Imperial Airways aeroplanes standing around outside the hangars.

If the contemporary issue of *Flight* (10th August 1939) is to be believed, this was because the company had virtually ceased to accept bookings for the Empire services on 9th August. The reasons given were shortage of aircraft, an increase in the amount of mail to be flown, a shortage of trained personnel, and a decision to carry greater fuel reserves. If this was true, the company had largely ceased to perform the functions for which it had been formed and it might be argued that the war possibly saved Imperial Airways' commercial bacon.

Part one of this article appeared in the September 1979 issue.—Ed.

It seems at least possible that the virtual cancellation of services (while the aeroplanes were obviously available) may have been due to an undisclosed desire to build up a pool of transport aircraft since the R.A.F. didn't have any worth mentioning—only a few Handley Page Harrows and Bristol Bombays which were something of a joke by current airline standards, let alone the harsher standards of war.

First sign

I think the first sign that suggested to me that there might really be a war was the painting of large red rectangles right along the upper surface of the wings of the Ensigns in about mid-August. When I enquired what this was for I was told that they were going to the Middle East and the painted wings would serve as a marker if they came down in the desert. I assumed that this was a move brought about by the likelihood of war because they hadn't done it for any of their earlier services which had been going there for years.

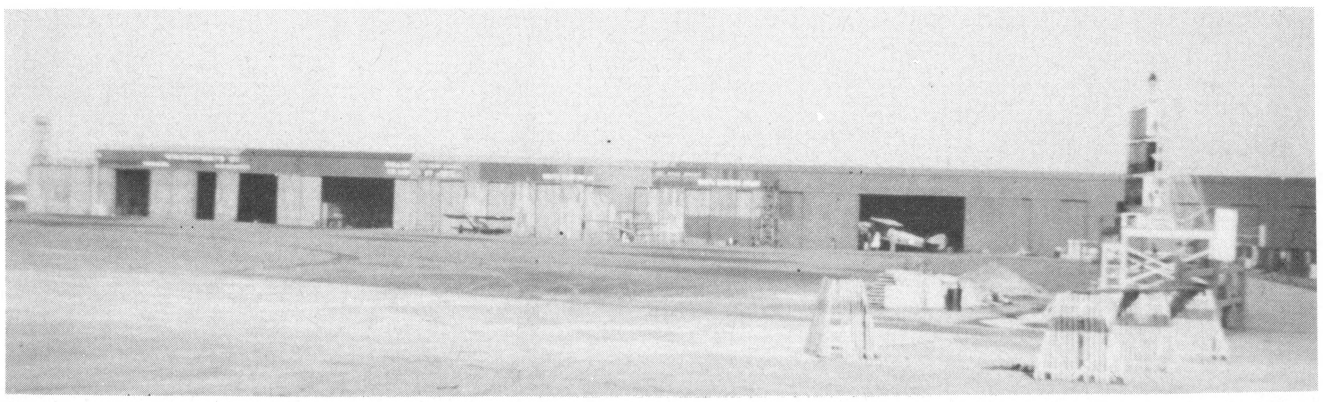
Meanwhile, over on the north side of the apron, all the small companies —Surrey Flying Services, Redwings, Olley Air Services, Air Dispatch, Wrightways and so on—were still flitting about in an entirely normal manner in their Moths, Dragons, Monospars, and the like, with a sprinkling of Lockheed 10s, 12s and 14s, Ju 52s and the occasional Airspeed Envoy. The five and ten bob flights "round the airfield and back for tea" went on right up to the end of August, give or take a day or two.

One aircraft so engaged was a D.H. Dragon Rapide, G-ACTT, with a blue fuselage and silver wings, belonging to Surrey Flying Services. About four o'clock one afternoon Ron Fox scribbled a note on a piece of scrap paper and gave it to me to give to the Rapide's pilot. It said, "Please fly these cadets if the opportunity occurs". This was an unexpected pearl beyond price. I think two of our cadets got a flight before the pilot knocked off for the day but I never did get to fly in that Rapide.

This must have been about 27th August and I have been surprised ever since that such things went on until almost the very last day before the war started. The Germans were, of course, quite a long way off by the standards of the time—back beyond the eastern borders of France—and there ought to have been good warning of any advancing hordes. Also, a high proportion of the civil airline pilots and ground staffs were ex-Service people from the first World War and they no doubt felt that they had plenty of time to get away "if the balloon goes up"—as they tended to say.

That particular metaphor makes me wonder when the balloons really did go up—the barrage balloons over London, that is. I certainly remember the sudden and rather beautiful appearance of

Hangars on the north side of Croydon being camouflaged to simulate a block of flats. Three Hawker Harts are parked outside



Four of No. 3 Squadron's Hawker Hurricane Is, bearing "QO" codes, dispersed near the junction of Foresters Drive and Plough Lane

hundreds upon hundreds of these silver shapes glinting in the sunshine and floating like an immense shoal of fat fish over London as far as the eye could see. I don't know how far out the belt extended but there were none in the Croydon, Wallington, Purley area, perhaps because of the airfields. There had already been some complaints from airline pilots about the risk of collision with the odd balloon that escaped, or with the increasing number of trainee R.A.F. pilots tearing about in and out of clouds.

The change-over from peace to war conditions on the aerodrome was sudden, dramatic and total. It must have been about 30th or 31st August that I drifted into the booking hall and found it in turmoil. It was the unexpectedness that was striking. The Germans had not yet attacked Poland— the great issue that was to decide war or peace—but people were trotting about all over the place. Packing cases were much in evidence, waste paper baskets were being filled with unwanted papers, and I learned that the airlines had had orders to move to Whitchurch. What was to happen at Croydon they didn't know. In Whitehall the Service Ministries would have been among the first to know about this and to act on it. There is also evidence now that the R.A.F. in general, and Fighter Command in particular, took a very jaundiced view of Chamberlain's promise of "peace in our time".

Throughout the 30th and 31st civil aircraft filtered away in a manner which was indistinguishable from normal operations. There was no dramatic evacuation of fleets of aircraft in formation, just a gradual diminishing of the numbers standing about on the tarmac. The big moment (though it was all in the mind really) was the departure of Lufthansa on, I think, the 31st. They had never kept more than one or two aircraft at Croydon and now they had only one Ju 52 left.

Personal send-off

When it was ready to go I went up to the tower to watch its departure. I was, in fact, allowed to use the Aldis lamp mounted on the north-west corner to signal the last German aeroplane to leave the country. I can see that Junkers now, standing over by the black and white chequered fence along Stafford Road, the northern boundary. He was pointing south-east, which meant an uphill take-off, and waiting for me to give him permission to go. I aimed the sight carefully at the cockpit, flashed the light and held it there as the Ju 52 began to roll. In thirty seconds or so he was gone. No one in the tower made any comment.

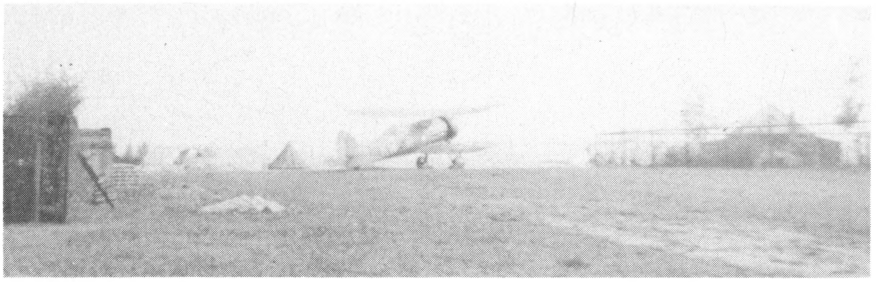
My group of cadets had now dwindled to two or three and we really had no status or function anymore, but I think we had been overlooked in the general confusion of packing up and dispersing.

One of my first calls was on the deserted Lufthansa office on the balcony above the booking hall to see if there were any pickings—souvenirs I would have called them then. I was in luck. The Germans had left behind some elegant airmail stationery. Some of the envelopes bore a picture of a Zeppelin, some of a Heinkel He 70. These I appropriated. A more valuable item was a weighty tome entitled "Grosser Luftverkehrs-Atlas von Europa" giving details, with maps, of all the main airfields of Europe. It included, naturally, course details from various places in Europe, via Calais or Etaples to Croydon, plus location details such as "Kenley 2,4 km NNW von Caterham; 8 km S von Croydon" and "Biggin Hill 7,2 km NNW von Westerham; 10,4 km SO von Croydon (Flughafen)". A moment's thought might have shown me that this was all routine information but I felt quite insecure when I realised that all those Germans knew exactly where we were.

It was probably on this day too that I first noticed a tall, dark R.A.F. officer in service dress with a little gold "A" on each lapel, striding about with papers in his hand. Someone told me that he was F/Lt. Cooper and that he was going to be commandant of Croydon when the R.A.F. took over. I think his proper job may have been adjutant of No. 615 Squadron, the County of Surrey unit of the Auxiliary Air Force, equipped with Gladiators and stationed

No. 3 Squadron Hurricane "QO:N" with interested spectators, October 1939

An A.A. post at Croydon, October 1939



No. 615 Squadron Gladiator "KW:R" viewed from the north end of Foresters Drive

Worm's Eye View . . .

at Kenley. It is obvious now that he knew something which was by no means common knowledge—namely, that there had been what Basil Embry called an "unobtrusive" mobilisation of certain R.A.F. units on 23rd and 24th August.

This evidently included Fighter Command because on 1st September they arrived. That is to say that for forty years I have believed that it was 1st September—two days before the British declared war on the Germans. J. D. R. Rawlings in his book *Fighter Squadrons of the R.A.F.* suggests 2nd September, which may be right. Higham indicates that Imperial Airways and the civil administration were still in occupation up to 7th September, but this is not correct.

I was in the main building at the time and suddenly became aware of a steady and sustained roaring noise which brought me outside like a cork from a bottle. Overhead, in a great circle round the airfield, at a height of perhaps 2,000 ft. was an enormous procession of fighters. I had never seen so many aeroplanes at one time before. Most of them were Hurricanes but some were Gladiators. I tried to count them and I thought I reached the figure of sixty but it was very difficult to tell since they were all on the move and one couldn't be sure where the circle began and ended.

Hurricane

The impact of their appearance was enormous. The Hurricane was then, in effect, the latest thing in fighters. The R.A.F. may by then have had a few squadrons of Spitfires but I had never seen even one, let alone a squadron. The first Hurricanes had been delivered to No. 111 Squadron only about eighteen months previously, making it "the world's most formidable fighter squadron". The R.A.F. had then in service twenty-nine main types, but only nine were monoplanes and they included such things as the Magister.

Until now R.A.F. planes had been distinctly unusual at Croydon and there was a definite air of careful enquiry in the way in which this impressive armada flew round and round the airfield, apparently getting a good look at the layout and the approaches, checking on the wind and then peeling off, one by one to land while the others rumbled on and on in endless circuits which were no doubt very good for local morale.

I was fascinated by every minute of it and watched every landing to see if they all made it safely, approaching from the north and landing over the Stafford Road fence. Every one did, though one Hurricane lost its port wheel and ground quickly to a stop in a rather ungainly position. The others, as they landed, taxied off to various positions round the perimeter which I later learned to call dispersal points. It seemed an obvious thing to do at the time but in fact it was a display of professionalism which has been notably lacking in various air forces on a number of occasions from Pearl Harbor onwards.

The reason for it was no doubt the fact that these were units of the regular Royal Air Force, Nos. 3 and 17 Squadrons with Hurricanes, and a leading unit of the Auxiliary Air Force, No. 615 Squadron, with Gladiators. This was by no means the air force which later fought the Battle of Britain and it differed markedly from the citizen air force of, say, 1943 and 1944. In September 1939 Douglas Bader, for example, was an obscure and disabled ex-serviceman working as a clerk in the City of London, Richard Hillary was a rather obnoxious undergraduate (spoiled, selfish and egocentric are his own words), Neville Duke was a junior clerk in an estate agent's office, and so on. Meanwhile, the ex-public school boys who made up the majority of the R.A.F.'s regular pilots, were a carefully selected elite, chosen primarily for promotability in time of war, in accordance with Lord Trenchard's policies. They flew their aeroplanes in service dress and collars and ties, or in immaculate white overalls, maintained formations based on vics of three, and were trained to carry out formation attacks which called for them to keep their eyes firmly on the formation leader rather than on the target. Like the bomber pilots, they were very good, in a formal sort of way, but they had a great deal to learn.

At this time the Service contained none of the Poles, Frenchmen, Belgians, Czechs, Dutch, Norwegians and the like who were to bulk out their numbers in later years. There was, however, a sprinkling of Australians, New Zealanders, Canadians, South Africans and Irishmen, all volunteers of course.

Commanding these smart young men were many squadron leaders and wing commanders who had seen service in World War I or had got into the service shortly afterwards. A man born in 1898 could easily have served throughout 1917 and 1918 and would still have been only 41 in 1939. After the slow promotion of the peacetime years it would have been quite normal for him to be commanding no more than a squadron, just as it would have been quite normal for him to be spending most of his time on the ground, dealing with administration rather than leading the squadron in the air. The era of the 25- to 30-year old squadron leader was still a year ahead and the 21-year-old wing commander, such as Paddy Finucane, was an undreamed of development brought about by massive casualties to regular officers during 1940 and the massive expansion of the citizen air force in 1941–43. But that is another story which in 1939 lay far off in the invisible future.

Auxiliary A.F.

The Auxiliary Air Force, much more recently formed, was in much the same situation, with the disadvantage that it was hardly possible to reach quite the same level of training when they could fly only at weekends and on an annual fortnightly camp. No doubt they would argue that their military efficiency was quite as high as that of the regulars since they concentrated on flying while the regular air force spent too much time being officers and gentlemen in offices and staff colleges. That was an argument which lost its point before long, when the Auxiliary Air Force squadrons ceased to be the preserve of what the regulars would have called rich and privileged amateurs.

Whatever the value of these points, Croydon had suddenly become a very different sort of place from the civil aerodrome of the last ten years. The officers took over the Aerodrome Hotel as a mess while the odd wooden hut and a speckling of camouflaged bell tents began to spring up around the perimeter (another new word) to serve as flight offices and pilots' rest rooms. No. 615 Squadron had the corner behind Waterers Rise and the north end end of Foresters Drive, while the Hurricane squadrons were spread from Roundshaw Park round the south end of Foresters Drive and along the fence at the edge of the Imperial Airways' playing field.

My main memory of Saturday, 2nd September is of the enormous amount of road traffice trundling down the Purley Way that evening towards London. Hitler had now invaded Poland, the British ultimatum had gone out, and if the Germans didn't call off their attack the war would be on the next day.

From my lowly viewpoint at Croydon 3rd September was also a day of non-events, apart from the famous occasion of the air raid warning which followed immediately after Neville Chamberlain's speech announcing that Britain was in a state of war with Germany. I didn't hear the broadcast, which everyone knew was coming, but I happened to be on the tarmac just outside the main administration building when the sirens began their eerie warbling. It was quite terrifying for a moment—especially when one didn't know that war had been declared.

The airfield was completely uncamouflaged, still (I think) without ground defences of any kind, and apparently wide open to attack. Along with most people at that time I had no knowledge of the existence of the radar warning system, nor of the Fighter Command control system. It never occurred to me that if there really was going to be an attack people would probably be dashing about like mad and fighters would be taking off in large numbers.

But all remained as peaceful as it did on any normal Sunday morning—more peaceful than usual, in fact, since not a single engine started up and the tarmac and hangars were empty of the aeroplanes which had crowded them only four days earlier.

Varied versions

The difficulties of writing accurate history (if there is any such thing) are underlined by that first false alarm of the war. According to Robert Wright, Dowding's ex-P.A. (in his book *Dowding and the Battle of Britain),* it was caused by an unannounced French aircraft "bound for Croydon, bringing to England some French officers on official business".

According to Al Deere's book *Nine Lives,* "a lone aircraft returning from patrol in the Channel was plotted as hostile and a squadron was scrambled to investigate. This squadron became split and sections from it were in turn plotted as hostile . . ." Dowding, correcting Deere (and his own P.A.), says: "What happened on this occasion was that a refugee aircraft from Holland flew in without due notice. . . ."

What "a refugee aircraft" would be doing flying in from Holland, nine months before that country came into the war, is not clear but it is evident that the sky was apparently full of unidentified aircraft on 3rd September. I am sure of only one thing—no French aircraft arrived at Croydon on that day.

Next day, or perhaps the day after, I was very startled to read in the newspaper that Blenheims had attacked the German fleet in Wilhelmshaven. It was, of course, what they were for but we had been so trained to regard the Germans as the aggressive "baddies" that it came as a great surprise to find the R.A.F. lashing out first.

Against a background of this sort life at Croydon was all anti-climax. The change-over from peace to war had been dramatic enough and the new regime was fascinating but little was happening which one couldn't have seen any day at Kenley over the previous five years, except that the silver aeroplanes of peacetime were now painted dull green and brown.

(To be concluded)

Prominent at the "Open Day" held by the U.S. Naval Air Test Center, Patuxent River, Maryland, on 5th October was the McDonnell Douglas F-18A Hornet, 160779 (foreground). Immediately behind it is the first prototype AV-8B Advanced Harrier, 158394. Other types on view include an A-4 Skyhawk, A-7 and TA-7 Corsair IIs, A-6 Intruder, F-4 Phantom, F-14 Tomcat, KA-3 tanker version of the Destroyer (nose just visible on left), S-3 Viking and a couple of P-3 Orions

Christmas Bookshelf

The Rise and Fall of the Aircraft Carrier
by Bernard Ireland (Marshall Cavendish, £6.95)
This is a handsome book full of evocative photographs of quality showing the evolution of the aircraft-carrier from the earliest days of naval flying to the present time. The text gives a condensed account of some of the highlights of naval air operations conducted from British, United States and Japanese carriers.

In spite of the somewhat contentious title, the author who is remarkably well informed, makes an unanswerable case for the Fleet's need to carry and operate its own aircraft of both fixed- and rotary-wing types. In fact, the only aircraft-carrier whose future is threatened, according to this book, is the large strike carrier so brilliantly used by the U.S. Navy in the Pacific in World War II. Even this type seems destined for a stay of execution if a potential enemy decides to develop a modern version of the strike carrier, possibly as a commerce raider on a grand scale. The suggested scenario of thermo-nuclear-headed ballistic missiles continuously programmed by reconnaissance satellites to destroy super carrier task groups is hardly a realistic one. Reconnaissance satellites are likely to be the first casualties in a future war.

The book has a good deal to say about the development of naval aircraft and criticises the obsolete types of aircraft with which our own Fleet Air Arm began World War II. Where parsimony is concerned, British military history has a tragic habit of repeating itself. The conclusion is inescapable that air power is an indispensable component of sea-power whether it be carried in a few large vessels or scattered around in smaller less efficient packets to spread the risk.

The book is strongly recommended for its content and objective comment.—*A.S.B.*

Charlie Mike Charlie
by Clive Canning (C.J. Publications, £5.50)
This Australian book may be obtained post free from the Popular Flying Association, Shoreham Airport, Shoreham-by-Sea, Sussex, and is the "true adventure story" of a flight from Australia (Melbourne) to England (Shoreham). There are a number of coloured illustrations in the book, including those of the aircraft, Thorp T18 VH-CMC, flown to and from this country in 1976. The trip out was made in a flying time of 98 hours, the time taken (including two days in a Syrian prison) was 16 days. Since the Thorp monoplane with its 150-h.p. Lycoming O-320-E2A engine was home-built, the performance by Clive Canning rivalled that of Bert Hinkler and indeed it merited the Roderick Turner Memorial Trophy at Sywell in 1977, Canning being the first non-Englishman to receive it.

There is an index of abbreviations, an appendix of the flight statistics, another of the recipients of the Oswald Watt Medal, and a third of the flight diary which is of course presented in prose form throughout the book. It is quite a record.—*G.J.P.*

Purnell's History of the Second World War
edited by Barrie Pitt (Phoebus, 24 monthly parts £1.50 each)
This is the latest reissue of the best-ever military part-publication series originally launched in 1966. Now the weekly parts have been gathered together to form a new monthly edition. The strength of a good product is the test of time. Well-researched, well-written and intelligently illustrated, *Purnell's History of the Second World War* is certain to find yet another new audience converted to the stylish presentation and prepared to stay the course for the next two years.—*C.W.C.*

Classic Fighters '80 Calendar
(Falcon Publications, 61/62 Lincolns' Inn Fields, London W.C.2, £1.30 plus 20p direct from the publishers)
Measuring 14 in. × 12 in., this black and white calendar provides a dozen high-quality photographs of fighter or pseudo-fighter aircraft covering the period 1943 to date. This year's selection includes such diversities as the Firebrand, P-38 Lightning, Tornado and a New Zealand Mosquito. The use of black and white is deliberate: "to feature the best in aviation photography," say the publishers.—*J.D.R.R.*

Lancaster
by Neville Franklin and Gerald Scarborough (Patrick Stephens, £4.95)
Neville Franklin knows his Lancasters and in this book (No. 6 in the "Classic Aircraft" series) has skilfully managed to describe all the needed history within a fairly restricted compass, adding the Lancastrian and York for good measure. The text is punctuated by representative illustrations with the serious modeller in mind, as well as some for picturesque value. These are also useful 1/72nd-scale side elevations of different versions showing the markings. In Part Two Gerald Scarborough deals with converting the basic Lancaster into special versions or the Manchester, Lancastrian or York and also gives a chapter on hyper-detailing a 1/72nd-scale kit of the "Lanc." A new and worthwhile presentation.—*J.D.R.R.*

Air War Vietnam
(Arms & Armour Press, £5.95)
According to the dust jacket *Air War Vietnam* purports to be a "detailed and fully illustrated history of U.S. aerial operations in Indo-China between 1964 and 1973 plus an account of the Mayaguez incident of May 1975". In fact, the book is a collection of four papers previously published by the U.S.A.F. as part of its Southeast Asia Monograph Series.

Each paper concentrates on a particular facet of the air war, *viz.*, the air-to-air fighting over North Vietnam, the bombing of the North's major bridges, the March 1972 invasion of South Vietnam and the Mayaguez incident.

Although not a comprehensive or systematic survey of the air war, the accounts are nevertheless very detailed and well written. The authors are all U.S.A.F. airmen who have had first-hand experience in South-East Asia. Unfortunately the illustrations, although very interesting, have not reproduced very well and appear to be rather flat and dull.—*C.M.H.*

The Hardest Day
by Alfred Price (Macdonald & Jane's, £5.95)
Sunday, 18th August, 1940 (and not the commemorative 15th September) was the hardest-fought 24 hours in the *Luftwaffe*'s extended "Assault on England", the legendary Battle of Britain. And because it was so fiercely fought, contemporary claims now read like cricket scores. With greater attention to miniscule detail than any previous author has attempted, the overall picture presented by Alfred Price is, nonetheless, both awesome and heroic. The action is, on occasion, minute by minute, not only from the defending R.A.F.'s viewpoint but also from the attackers' angles. Praise be, too, the literary style is most readable and there are maps, diagrams and hitherto unpublished photographs to enhance this excellent work.

As far as possible, the author has tracked down the fates of the 174 R.A.F. and *Luftwaffe* combat aircraft* which were either destroyed or damaged (but later repaired) on this hardest day. *The Hardest Day* is in a class of its own. Buy it, read it; you won't be disappointed.—*C.W.C.*

* According to Alfred Price's meticulous researches, R.A.F. combat losses amounted to 52 Hurricanes and 21 Spitfires of which, respectively, 20 and 14 were repairable at a later date. A 74th casualty was a night-flying trainer Anson which collided with a marauding He 111. In the same 24-hour period, the *Luftwaffe* lost 69 combat aircraft and suffered another 31 damaged but repairable. The heaviest losses were among the escorting fighters (18 Bf 109s and 16 Bf 110s) and the single-engine dive-bombers (17 Ju 87s). Collectively, however, the two-motor bombers fared no better; excluding the Anson write-off of an He 111, there were 17 other total losses: 6 Do 17s, 7 He 111s and 4 Ju 88s.

RECENT NOVELS

The fifth title in the series by Alexander Barrie called **Jonathan Kane Climbs High** *(Muller, £3.50)* is strictly for the younger reader with a Scottish bent, although devolution with a Scottish King is bound to appeal to romantics as a theme. Sergeant George Yeoman is the hero of **Hurricane Squadron** *(Barker, £3.95),* Robert Jackson's new book for that category known as "Young Adult", and is concerned with tales of derring-do above the B.E.F. just before the fall of Dunkirk. In **Squadron Scramble** *(Barker, £3.95)* we find "Yeoman in the Battle of Britain" weaving about above the hopfields of Kent, more descriptively described in **A Moment in Time** by H. E. Bates *(Michael Joseph, £2.75)* and recently televised in four episodes on BBC TV.

Group Captain Patrick Raymond's sixth book is a novel entitled **The White War** *(Cassell, £4.25)* and is partly about a bomber station (Halifaxes) in Yorkshire and partly about a group of Polish airmen who have their own ideas about getting their own back on their enemies; and these are not necessarily the Germans. (We will give you a hint and remind you about the Katyn massacre.)

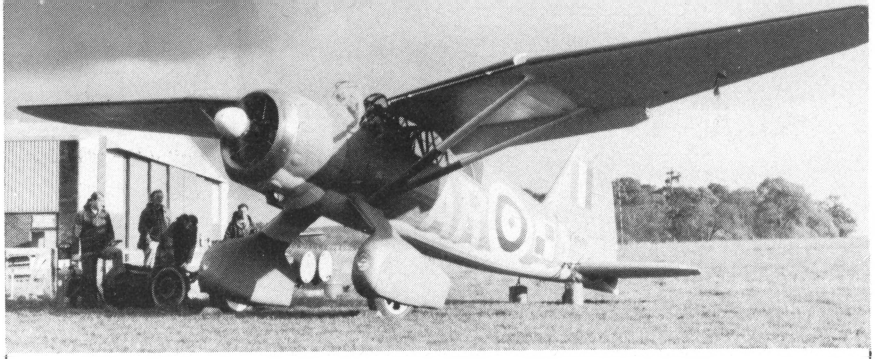
Vixen 03 by Clive Cussler *(Hodder, £4.95)* is from the author of one of the books about the *Titanic* which is being filmed at present. Inasmuch as it is set in 1988, it could be called science-fiction, and anyone in Brighton over the August Bank Holiday will know that about 6,000 people attended the World Science-Fiction Convention there, and that is where the market lies. It is about a Boeing Stratocruiser which crashes into an ice-covered lake in Colorado in 1954 carrying canisters of plague germs; thirty-four years later a couple of the canisters are found to be in the hands of African terrorists and our hero . . . new readers begin here!

Finally, a couple of paperbacks: Dan Brennan, an American who flew from British bases in the war, weighs in with **The Sky Remembers** *(New English Library, 75p),* which is "Spits" and Me's over Britain, pocketa-pocketa, thud, and **Foxbat** by Peter Cave *(Futura, 95p)* is how to try to catch a MiG-25 by the tail(s) if you are in the C.I.A. or whatever.—*G.J.P.*

AVIATION FACTS

Among the recent non-fiction "instructional" books to be published is **Flying Wisdom** (also known as Pilot Wisdom) by the Editors of *Flying* Magazine (the monthly American periodical) *(Van Nostrand, £9.75).* It is a hefty volume of over 350 pages divided into three sections, "Weather", "IFR", and "Pilots, Know Your Planes", and is in effect an anthology of fifty articles by various writers culled from the pages of *Flying.* Thus there are a lot of useful hints for the pilot and would-be flier.

J. S. Evans is the author of another heavy book, **Pilot's Manual** *(Poyser, £7.00)* designed for the private pilot, containing a detailed contents list, over 350 pages of text and relevant diagrams, a glossary, but no index. Since the contents list is so detailed an index was probably regarded as superfluous, and the contents consist of everything you would expect from theory of flight to documentation, from airframes to flight rules, and from navigation to meteorology. From the same publishers is a slimmer volume, **Light Aircraft Inspection** by J. E. Heywood *(Poyser, £4.00),* full of photographs of rust, corrosion, cracked spars and worn out oil-coolers, most of which reminded me of my car *before* its regular MOT test!



About to become airborne again, Westland Lysander III G-AZWT (ex-R.C.A.F. 2355) was acquired by the Strathallan Aircraft Collection, Auchterader, Scotland, in a wrecked state in 1971 and has been painstakingly rebuilt; it is seen here performing final engine runs. The Lysander has been painted to represent an aircraft of No. 309 (Polish) Squadron when based at Gask. The Strathallan Collection was described in our May 1977 issue

Lots of colour photographs abound in Volume 1—North America Part 1 of the **Encyclopedia of Airline Colour Schemes** by Ian Mackintosh *(Airline Publications, £6.50)* and it is this excellent colour work, essential for a book of this kind, that makes it relatively expensive. Apart from the 92 U.S. and 60 Canadian airlines depicted by aircraft of those carriers, there are also 152 insignia in colour.

Another foreign biography recently published, translated and edited by Peter Kilduff, is **Germany's Last Knight of the Air** *(Kimber, £6.95),* being the illustrated memoirs of Major Carl Degelow who became the C.O. of *Jagdstaffel 40* in 1918 and had 30 confirmed victories as his tally. The book consists of 218 pages including a list of Degelow's aerial victories, a bibliography, glossary, index and over eighty photographs incorporated with the text or printed as separate items. There is a certain amount of politicking and an attempt or two at camaraderie in the air when all one really wanted to do was to shoot the other chap out of the sky.—*G.J.P.*

USEFUL GUIDES

Every week "spotters" peer through fences or over parapets to identify and log aircraft variants from the Shooting Star at Carbondale, Illinois, to the GAF Nomad over the outback; which sentence brings us rather neatly to all the American aircraft registered in the Antipodes which appear in **The Observer's Book of Civil Aircraft of Australia and New Zealand** by Timothy and Elizabeth Hull *(Warne, £1.95).* There are no silhouettes in this book, but nearly 200 photographs and basic details of aircraft, including the number registered both in Australia and in New Zealand; it is an interesting compilation.

And so in its own little way is **What Plane: Beginners' Guide to Airliners** by Ian Mackintosh *(Gresham Books, £1.00),* a 64-page paperback covering nearly sixty airliners of all types and nations with a page for each; the treatment is minimum data, three photos (one large, two small) and an identification text. It is very useful for those new to the ranks of the gongoozlers at Heathrow, and deserves to be better known.

There is a new edition of **Jane's Pocket Book 5** compiled by M. J. H. Taylor and Kenneth Munson entitled **Military Transport and Training Aircraft** *(Macdonald, £4.95)* in the useful limp-cover landscape shape. There are about 130 aircraft inside the covers (for an extra twenty shillings you can have a hard-cover version), each with a large photograph, a miniscule general arrangement drawing, and basic textual details, which leave a lot of white space to be filled for many of the pages. An index and an operators' key are also provided.

Three hard-cover books *(Ian Allan, £4.95 each)* complete this month's survey: **World Military Aircraft since 1945** by Robert Jackson, **Air Forces of the World** by Barry C. Wheeler, and **World Civil Aircraft since 1945** by Michael Hardy. All are similar in size and "shelve" nicely. Each have photographs, basic details, historical descriptions, and are over 110 pages long. The "minor" aircraft are treated in a less important way, but the collection as a whole forms an ideal basic reference unit. It should be noted that some of the descriptions (the Mosquito for example in Jackson's book) are comprehensive, and the colour photos and jackets are attractive.—*G.J.P.*

Register Review

by A. J. JACKSON

Registration	Type	c/n.	Previous Identity	Remarks
United Kingdom				
G-AYUI	Cherokee 180	28-05043	N8557	Restored to Routair Aviation Services Ltd., Southend
G-BDVH	HS748 Series 2A	1746	6C-BEA	Restored to British Aerospace Aircraft Group, Woodford
G-BEKA	One-Eleven 520	230	4X-BAR	Restored to Dan-Air Services Ltd.; d/d Hurn–Ringway 3/10 for repainting
G-BGIX	Helio H295 Courier	1467	N68861	Nordic Oil Services Ltd., Turnhouse
G-BGNS	Cessna F172N	F.1901		Denham Flying Training School Ltd., Denham
G-BGNT	Cessna F152	F.1644		
G-BGPK	AA-5B Tiger	1258		Cabair Ltd., Elstree
G-BGTC	Auster AOP9		XP282	S. Vince
G-BGXC	TB10 Tobago	35		A. J. Halliday
G-BGXD	TB10 Tobago	39		J. Traynor, Speke
G-BGXR	Robin HR200/100	53	F-BVYH	J. H. Spanton, Canterbury
G-BGXT	TB10 Tobago	40		County Aviation Ltd., Wolverhampton
G-BGYS	Bandeirante	231		Air Anglia Ltd., Norwich
G-BGYT	Bandeirante	234		
G-BGYU	Bandeirante	243		
G-BGYV	Bandeirante	249		
G-BGYW	Hughes 269C	1130257		G. Hewson, Crowborough, Sussex
G-BGYX	Hughes 269C	1130253		
G-BGYZ	Hughes 269C	1120171		
G-BGZC	CASA Jungmann		E3B-305	J. E. Douglas, Principat d'Andorra, Spain
G-BHAH	Sikorsky S-61N	61767		Management Aviation Ltd., Bourn
G-BHAX	Enstrom F-28C	486-2		Spooner Aviation Ltd., Shoreham
G-BHBB	Colt 77C	012		Mrs. S. D. Bellow, London
G-BHCB	AA-5A Cheetah	0863		Cabair Ltd., Elstree
G-BHCE	Jodel D112	381	F-BHME	G. F. M. Garner, Swindon
G-BHCJ	HS748 Series 2	1663	RP-C1025	Dan-Air Services Ltd., Gatwick
G-BHCK	AA-5A Cheetah	0810		Cabair Ltd., Elstree
G-BHCL	Boeing 737-200	21955		Orion Airways Ltd.
G-BHCM	Cessna F172H	F.0468		P. S. Bubbear, Dunstable
G-BHCN	AS350B Ecureuil	1151		McAlpine Helicopters Ltd., Luton (re-registered G-JANY q.v.)
G-BHCT	Aztec 250	27-54113	N6925A	Colt Transport Ltd.
G-BHCZ	PA-38 Tomahawk	38-0321	N214MD	Capital Aviation Sales (UK) Ltd., Staverton
G-BHDC	T.65A Vega	1915		Slingsby Engineering Ltd., Kirkbymoorside
G-BHDD	Varsity T.1		WL626	M. Deedy and the Loughborough and Leicester Aircraft Museum
G-BHDF	Baron 58P	TJ-250		Eagle Aircraft Services Ltd.
G-BHDM	Cessna F152	F.1684		Air Service Training Ltd., Perth
G-BHDN	Cessna F182	F.0132		
G-BHDO	Cessna F182	F.0133		
G-BHDP	Cessna F182	F.0131		
G-BHDR	Cessna F152	F.1680		
G-BHDS	Cessna F152	F.1682		
G-BHDU	Cessna F152	F.1681		
G-BHDW	Cessna F152	F.41652		Spooner Aviation Ltd., Shoreham
G-BHDX	Cessna F172	F.1889		
G-BHDY	Cessna F172	F.1905		
G-BHEK	Super Emeraude	923	F-BJMU	D. B. Winstanley
G-BHEL	Jodel D117	735		J. L. Phelps, Reynes, France
G-BHEM	Bensen B8M	EK.14		E. Kenny, Leeds
G-BHER	TB10 Tobago	60		J. Traynor, Speke
G-BHES	TB10 Tobago	61		
G-BHET	TB10 Tobago	62		
G-BHEU	Thunder AX-7/65	238		Thunder Balloons Ltd., London
G-BHEV	Cherokee Arrow	28R-35159	PH-BOY	A.F. Aviation Ltd.
G-BHEW	Sopwith Triplane replica	PPS/REP.9		Hon. Patrick Lindsay, Booker (built by Personal Plane Services)
G-BHEX	Colt 56A	056		A. S. Dear and partners
G-BHEY	Pterodactyl OR	PF.089		High School of Hang Gliding
G-BHFA	Pterodactyl OR	PF.051		
G-BHFB	Pterodactyl OR	PF.088		
G-BHFC	Cessna F152	F.1436		Trehaven Trust Ltd., Biggin Hill
G-BHFE	Seminole 180	44-95324	N2383U	N. Clayton
G-BHFF	Jodel D112	322	F-BEKC	J. A. Scott
G-BHFH	Seneca 200T	34-70482	N8075Q	Heltor Ltd.
G-BHFI	Cessna F152	F.1685		Westair Flying Services Ltd., Squires Gate
G-BHFJ	Cherokee Arrow 201T	28R-31298	N8072R	C.S.E. Aviation Ltd., Kidlington

The following out-of-sequence registrations have also been allotted:

G-BMFD	Aztec 250	27-54080	G-BGYY	Express Aviation Ltd., Biggin Hill

Pictures taken in July in a register where the canker of personalised markings is as yet unknown: Fiji Air's Islander DQ-FBP, once G-AYAY, at Nansori, Suva: Air Pacific's Trislander 2 DQ-FCG, formerly G-BCXY, also at Nansori; the Hiller UH-12E4, DQ-FCJ, of Pacific Crown Aviation and Marine Pacific's Queen Air DQ-FCQ at Bua on Vanua Levu; and Twin Otter DQ-FCY newly delivered to Suva and fresh from its acceptance checks (Photos: P. J. Cooper)

G-ECGC	Cessna F172	F.1850		Rogers Aviation Ltd., Cranfield
G-FERG	AS.350 Ecureuil	1040	G-BGCW	Ferguson Aviation Ltd.
G-HMCG	BN-2A Islander	847	G-BESH	Renco Aviation Ltd., Lydd
G-IANS	Commander 690B	11465	N81767	Stanair Ltd.
G-JANY	AS.350B Ecureuil	1151	G-BHCN	P. E. Cadbury
G-JONS	Navajo Chieftain	31-52187	N35333	C.S.E. Aviation Ltd., Kidlington
G-LYDE	PIK-20E	20217		G. S. Wilson, Stourbridge (previously given wrongly as G-CYDE)
G-NICK	PA-19 Super Cub	18-2065	PH-CWA	N. J. Cole
G-POOH	J3C-65 Cub	6932	F-BEGY	P. Robinson
G-RUIA	Cessna F172M	F.1856	PH-AXA	Citation Flying Services Ltd., d/d Deventer–Southend–Sherburn 5/10
G-SALA	Cherokee Six 300	32-4016	N21842	M. A. Lenihan, Sheffield
G-SATC	Cessna F150L	F.0883	PH-ECT	Citation Flying Services Ltd., d/d Deventer–Southend–Sherburn 26/10
G-STUD	Twin Otter 310	545	N302EH	Fairflight Charters Ltd., d/d to Biggin Hill 14/10
G-TOMS	PA-38 Tomahawk	38-0453		Channel Aviation Ltd., Guernsey
G-WING	Cessna 404	0442		Northair Aviation Ltd., d/d Reykjavik–Southend–Yeadon 22/10
G-WJMN	Commander 114	14247	N4954W	Shoreham Flight Simulation Ltd.

Fiji (complete current register courtesy of P. J. Cooper)

DQ-FBD	Airtourer 115	R.151	ZK-CMB	Flight Services Ltd., Suva
DQ-FBK	HS748 Series 2A	1665	VQ-FBK	Air Pacific Ltd., Suva
DQ-FBP	BN-2A Islander	614	G-AYAY	Fiji Air Ltd., Suva
DQ-FBQ	One-Eleven 479	245	7Q-YKG	Air Pacific Ltd., Suva
DQ-FBS	Baron C55	TE-446	VH-DEZ	Fiji Air Ltd., Suva
DQ-FBV	One-Eleven 479	250		Air Pacific Ltd., Suva
DQ-FCA	BN-2A Islander	686	G-AZXS	Fiji Air Ltd., Suva
DQ-FCC	Trislander 2	391	G-BCJX	Air Tungaru
DQ-FCE	Trislander 2	1004	G-BCNN	} Air Pacific Ltd., Suva
DQ-FCF	Trislander 2	1008	G-BCXW	
DQ-FCG	Trislander 2	1010	G-BCXY	
DQ-FCJ	Hiller UH-12E4	2534	C-FYYG	Pacific Crown Aviation (Fiji) Ltd.
DQ-FCK	Cherokee 181	28-90053		South Seas Charter Ltd.
DQ-FCM	Hiller UH-12E	HA-3034	N134HA	Pacific Crown Aviation (Fiji) Ltd. (Soloy conversion)
DQ-FCN	BN-2A Islander	676	G-AZGT	Fiji Air Ltd., Suva
DQ-FCO	SA.315B Lama	2473	N47320	} Pacific Crown Aviation (Fiji) Ltd.
DQ-FCP	Hughes 369D	570143D	N5669F	
DQ-FCQ	Queen Air B80	LD-288	N271	Marine Pacific Ltd., operated by Fiji Air Ltd.
DQ-FCR	One-Eleven 412	116	D-ALLI	Air Pacific Ltd., Suva
DQ-FCT	Aztec 250C	27-2336	N5467Y	Gilbert Islands Industries Ltd.
DQ-FCU	Cessna U206G	04698	N732MX	Turtle Island Airways Ltd.
DQ-FCV	Bandeirante	221		} Air Pacific Ltd., Suva
DQ-FCW	Bandeirante	225		
DQ-FCX	BN-2A Islander	833	G-BEMJ	Air Tungaru Ltd.
DQ-FCY	Twin Otter 210	208	N1024A	Fiji Air Ltd., Suva
DQ-FCZ	Cessna U206G	04413		Turtle Island Airways Ltd.
DQ-FDA	Cessna 185D	0908		Seaplane Charter Services Ltd.
DQ-FDB	Cessna U206G	04151	ZK-EKI	Turtle Island Airways Ltd.

REGISTRATIONS CANCELLED

Registration	*Type*	*Identity*	*Reason*
G-AJII	Auster 5	1588	To Canadian Warplane Heritage, Toronto
G-AJUD	Auster J-1	2614	Withdrawn from use
G-ATWH	HS125 Series 1B/R522	25094	Sold in Saudi Arabia
G-AUOM	Jodel DR221	2415	Cancelled due to clerical error
G-AWMJ	Cessna F172H	F.0550	Crashed at Biggin Hill 13/1
G-AYXV	Cessna FA150	F.0117	Withdrawn from use
G-BAPG	Viscount 814	344	Sold in Israel
G-BBTV	Jet Ranger 206B	1205	Sold in Switzerland
G-BCGO	Pawnee 260	25-4551	Ditched in Whitecliffe Bay, I.O.W. 15/7
G-BEFZ	HS125 Series 700	257001	Sold in Hong Kong
G-BEHI	Cameron DS-140 airship	200	Sold in Sweden

PRODUCTION LINE

...Britannia 253F (13457) G-BEMZ, Manston–Hurn 26/9, d/d to T. F. Richter and Co. Ltd., joining (12920) 5Y-AYR, ex G-ANCD

...Fw 190 scale replica G-WULF, built Elstree, by road to Leavesden 22/10

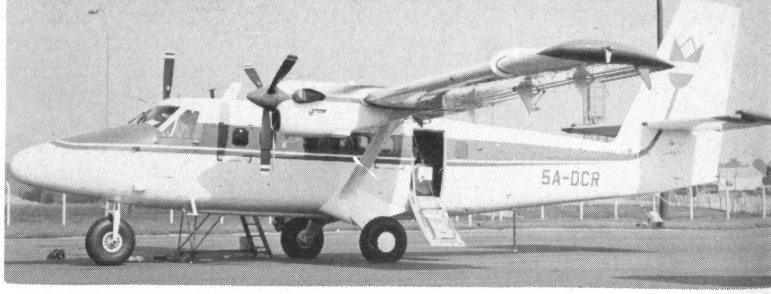
...HS125 Series 700: (257058) G-5-15, f/f at Chester 15/2, to USA as N125HS; (7066/NA0248) G-5-13/G-BGSR, d/d to Irving Oil 6/79; (7070) HB-VGG, for Robert Bosch; (7072/NA0252) N700HS, f/f 13/8, to USA 8/79; (7074/NA0253) N422X for Field Crest Mills; (7077/NA0255) N125AJ, for Virginia M. Ringer; (7078/NA0256) N125AK, for Chemed Corp.; (7080/0257) N125HS reissue, for May Dept. Stores; (7081/NA0256) N125AM for Carburundum Corp.; (7083/NA0259) N125AH; (7084/NA0260) N130BK, for Grouse/Hinds Corp.; (7087/NA0262) N130BL; (7090/NA0264) N299CT, for Caterpillar Tractors

...Islander (Gosselies-built): (1044) G-BEGY, to UK 31/8; (2008) G-BESU, to USA 5/8; (2009) G-BESV, to USA 24/8; (2015) G-BEXE, f/f 22/6, to UK 29/6; (2016) G-BEXF, to Turks and Caicos, West Indies, as N385KG

...Islander (Rumanian-built): (838) G-BEMP, d/d to Gabon 2/10 as TR-LYW; (841) YR-BNX, to UK as G-BESB, d/d to Colombia 24/8; (843) YR-BNY, to UK as G-BESD, d/d to Australia 8/6; (852) G-BEWA, d/d to Heli Orient, Singapore 6/8; (872) G-BFNN, d/d to Falkland Islands 12/9 as VP-FAY; (879) G-BFNW, f/f 20/2, to UK 20/7; (883) G-BFOA, f/f 30/5, to UK 29/8; (877) G-BFTJ, to Eastleigh 5/10 for storage

...Tiger Moth (85862) G-ANLS, d/d to P. A. Gliddon at Dalcross 15/10

British Island Airways' Bandeirante G-OAIR crew training at Stansted 28/9 (George Pennick); after long years as an instructional airframe at the College of Aeronautics, Tiger Moth G-AMNN is once more nearly complete at Shoreham (Don Conway); Ciba-Geigy Ltd.'s immaculate Auster J-5L Aiglet Trainer G-APVG at the Cranfield Business aircraft show in September (Roger Jackson); G-FOYL, one of the new Air Foyle Aztecs, at Elstree 9/10 (R. M. Weeks); CL-44D-4 PK-BAZ, ex Tradewinds' G-AWDK, at Gatwick 3/10 on arrival from Lasham for delivery to BAYU, Indonesia (M. J. Axe)



Left: *Trans Europe Air's C-47A F-BCYX visited Gatwick on 15/10.* Right: *5A-DCR was one of two Twin Otters which passed through Gatwick on 13/10 on delivery to Libya (both M. J. Axe)*

Airport Movements

Inverness/Dalcross

30/9	12409	CH-124, C.A.F.; F-BXLH Cessna 421B, c/n. 0860, on 2/10
5/10	PH-LTP	Cessna 402B, c/n. 0855; PH-PEM Seneca 200T on 11/10
20/10	C-GDPB	Gulfstream II, c/n. 232, Dome Petroleum, from Luton

Edinburgh/Turnhouse

1/10	D-IGAF	Rockwell 690A; F-GBLE Bandeirante; F-GAPY Lear 23 on 3/10
10/10	N110AN	JetStar; 12431 CH-124, C.A.F., from HMCS *Nipigon*, on 22/10
12/10	150496	VP-3A, c/n. 5022; 160769 P-3C, coded LJ-9, both U.S. Navy
15/10	G-BBAI	TriStar, British AW, type first visit; 'BAF on 30/10
	F 92	C-160F, French A.F., coded 61-ZJ; 171/63-VM Noratlas 31/10

Glasgow/Abbotsinch

19/9	D-INCC	Citation; OE-FIX Rockwell 690; F-GAPY Lear 23
21/9	EC-DHO	CASA 212; OE-FAP Citation, c/n. 0300, on 7/10
28/9	TF-FLH	Boeing 727-108C, Icelandair; 'FLG 727-185C on 7/10
30/9	OY-PRW	Partenavia P.68B; SE-GHO Cessna 182 on 3/10
4/10	OH-GLB	Lear 24D, c/n. 262, Kone OY; OH-PNT Cheyenne on 8/10
6/10	N100SR	Falcon 20C, c/n. 56; YR-BCL One-Eleven 525, Tarom
8/10	N4433C	Cessna 195; N98575 Cessna 340 on 10/10

Prestwick

1/10	132002	CC-132, C.A.F., type first visit; 109159 CC-109 on 6/10
2/10	70+66	UH-1D, W.G.A.F., with 71+08; 12431 CH-124, C.A.F., on 7/10
3/10	N3357S	Cessna U.185 floatplane amphibian, to Southend 4/10
4/10	N703SW	Boeing 747-245F, Seaboard World, first visit
5/10	HZ-PL3	Twin Otter, delivery; N13BT Citation I, Bar T Land Inc.
7/10	245	Wasp, Dutch Navy; 258 Atlantic on 19/10
12/10	117504	CC-117, C.A.F.; 70486 C-130D, U.S.A.F. N Y ANG, on 22/10
	150496	VP-3A, U.S. Navy; 161003 P-3C, VP-23 Sqdn., on 22/10
13/10	XB-ANQ	Aerostar, westbound; C-GDPB Gulfstream II, c/n. 232
18/10	EC-DDS	Kingair; N104TB King Air 100 and N33RE Aztec on 20/10
20/10	N2715S	Cessna 402; D-CDWN Lear 35 on 27/10, deliveries

Leeds-Bradford/Yeadon

28/9	OO-RTE	AA-5B Tiger, c/n. 1135; OO-JAE Cherokee Arrow on 30/9
8/10	N5296C	Cessna 310R, c/n. 1537; PH-AIC Cessna 340A, c/n. 0094
9/10	D-CONU	Falcon 20, Contactair; F-BRPK E.F.S.; F-GAMA Lear 23
11/10	F-GBLG	King Air 200, G.E.F.A.; F-GBLA Lear 24, Leadair, on 17/10
16/10	G-SHOK	Cessna 421C; G-BMLM Baron 58, both first visits
18/10	XS597	Andover C.1, 32 Sqdn., Northolt–Turnhouse

Manchester/Ringway

26/9	OO-SBS	Boeing 737-229, Sobelair on SABENA flight; N108WG Citation II, Elmdon–Luton; OY-GKC on 11/10
27/9	PH-NZD	S-61N, K.L.M. Helikopters, with 'NZK, Amsterdam–Dublin, fuel stop en route Eire for Papal visit, returned 2/10
30/9	N618US	Boeing 747-251F, Northwest, first visit; '617US on 7/10
1/10	HZ-AMK	One-Eleven 401, from Heathrow, to Reykjavik 4/10
2/10	F-GBMB	Lear 35, Uni-Air; N400J Gulfstream II, Johnson & Johnson
3/10	4X-BAR	One-Eleven 520, from Hurn, rolled-out 11/10 as G-BEKA in Arkia livery with Dan-Air titles and fin logo
7/10	PH-MBT	DC-10-30, Martinair, first visit, on Laker flight
11/10	SP-LAC	II-62, L.O.T.; ZK-NZM DC-10-30, Air New Zealand, diversions
21/10	N130K	Gulfstream II, American Can Co.; N2049E Baron 58P on 24/10
22/10	YR-BCM	One-Eleven 525, Tarom, first visit, with Leeds United F.C.

Northolt

25/9	RS 02	Sea King, Belgian A.F.; XV656, Royal Navy, on 4/10
6/10	01	VC-11A, U.S.C.G.; 128427 VC-118B, U.S. Navy, on 5/10
11/10	F-GBLG	Kingair 200, G.E.F.A.; 21448 OH-58A, U.S. Army, on 12/10
14/10	XT761	Wessex HU.5, Royal Navy, to B.B.C. Shepherds Bush
17/10	161000	P-3C, U.S. Navy VP-23; 6805 C-130H, Portuguese A.F., 23/10

London/Heathrow

23/9	XC-MEX	Gulfstream II, c/n. 96; N2GP, Washington Jet, on 24/9
25/9	CCCP65769	Tu-134A, Aeroflot; '86502 II-62M, both first visits
	HZ-AHL	TriStar, Saudia; 'AHM on 6/10, both deliveries
26/9	VT-EFU	Boeing 747-237B, Air India, first visit
27/9	N113AK	Lear 25, American Capitol; N13BT Citation I on 3/10
29/9	CCCP85367	Tu-154B-2, Aeroflot; '85364 on 5/10, both first visits
	TF-FLH	Boeing 727-108C, Icelandair; 'FLG 727-185C on 2/10
2/10	N101TV	DC-10-30, TransAmerica, Gatwick diversion
4/10	N703SW	Boeing 747-245F, Seaboard World; '704SW on 11/10
6/10	YA-LAS	DC-10-30, Ariana, delivery; YR-TPI Tu-154B-2, Tarom
10/10	N871TV	DC-8-63CF, TransAmerica on British AW freight flight
	D-CONU	Falcon 20F, Contactair; SE-DEP Citation on 11/10
12/10	HZ-AAA	Citation II; VR-CAO B.707-351B; N110AN JetStar on 14/10
15/10	LV-MLP	Boeing 747-287B, Aerolineas Argentinas, first visit

Stansted

30/9	OY-BTP	Navajo, Copenhagen Air Taxi; N51DB Lear 25D on 7/10
8/10	7T-WAQ	Friendship 4234M, c/n. 10543, Algerian Govt.
14/10	G-WWJC	Fellowship 4000, Air Anglia; EI-BDM Aztec
20/10	G-HADI	Gulfstream IITT

Norwich

5/10	PH-KFD	Friendship 275, N.L.M. on Air Anglia flights
10/10	XW222	Puma HCC.1, Army; XZ599 Sea King and VP955 Devon on 23/10
12/10	G-WWJC	Fellowship 4000, Air Anglia, delivery
15/10	PH-BBV	Fellowship 4000, left after Air Anglia lease
31/10	C-GHPW	Hercules 30, c/n. 4799, Pacific Western

Southend

28/9	N15SC	Lear 35A, c/n. 139, Sea Containers; N4577S Baron 58
1/10	HB-PDS	Cherokee 181; HB-LHO Cessna 421B, c/n. 0885, on 10/10
4/10	N3357S	Cessna U.185 floatplane amphibian, delivery to Norway
6/10	N40CH	Gulfstream II, Wayfarer-Ketch; N45LC Citation on 20/10
7/10	OO-VKB	Bonanza 36; OY-MBB Kingair 90, Maersk, on 10/10
11/10	N200BE	Navajo Panther; N6531N Cessna P.210 on 16/10
12/10	N2710G	A-26 Invader, Cavalier Air Force, Mildenhall—Gilze-Rijen
15/10	G-STUD	Twin Otter, Fairflight; D-EONA Piaggio P.149
22/10	G-FMFC	Bandeirante, Air Ecosse; G-CHEV on 23/10; G-MOBL on 26/10

Manston

18/9	WT478	Canberra T.4; XLZ192 Victor K.2 on 26/9
21/9	2112	Alouette III, French A.F., coded 341-EI, with 2124
26/9	31+07	Fiat G.91R-3, W.G.A.F. LKG-41, with 32+27
15/10	G-APFG	Boeing 707-436, British Airtours, diversion

Biggin Hill

2/10	N81632	Rockwell 690; N27939 Navajo on 8/10
4/10	OY-DZG	Aztec; D-GMWU Seneca, c/n. 7350268, on 12/10
9/10	N4433C	Cessna 195, en route to Middle East for possible sale
23/10	I-FJLC	Cessna T.310Q, c/n. 0424; G-BHRA Cessna 414 on 25/10

Southampton/Eastleigh

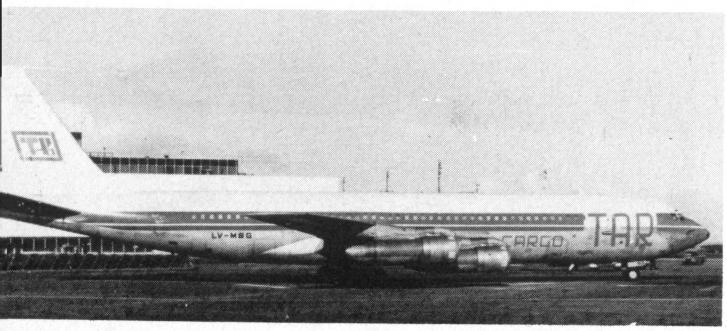
25/9	OY-BIS	Mu-2B-35, c/n. 630, Jetair; OY-BTR King Air 200 on 27/9
1/10	F-GBMG	Bandeirante, Brittair; G-OBIA, B.I.A., on 2/10; G-OAIR, B.I.A., on 18/10, all first visits

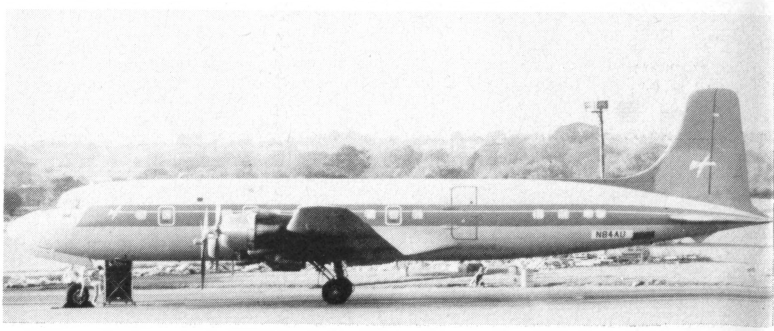
Gloucester-Staverton

4/10	G-C/ZA	Viscount 807, Southern International on Dan-Air flights
12/10	N56352	Maule M-5, to Little Staughton for painting
15/10	G-BGRE	King Air 200 delivery to Dowty Group
22/10	N26399	AA-5, from Gander, delivery to West Germany, left 28/10

We regret the non-appearance of several regularly-featured airports this month, due to non-receipt of the reports by our press closing date.

Left: *Transportes Aereos Rioplatense Boeing 707-321C LV-MSG, formerly G-BEAF, paid a rare visit to Shannon on 4/10 (David O'Mahony).* Right: *Interocean Airway's newly-acquired DC-6B N84AU, previously OO-IFA, arrived at Southend on 21/10 and is reported to be based there (Simon Murdoch)*





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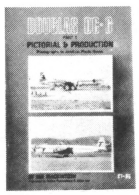

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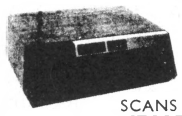

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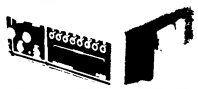

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A visitor to Canadian AFB Namao, Edmonton, in August was this U.S.A.F. Martin EB-57B Canberra, 21503, of the 158th Defense System Evaluation Group, Vermont ANG, Burlington. The 158th call themselves "The Green Mountain Boys" (Photo: D. J. Moyes)

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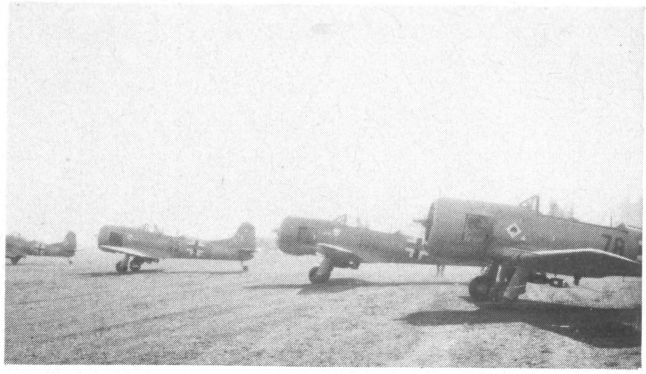

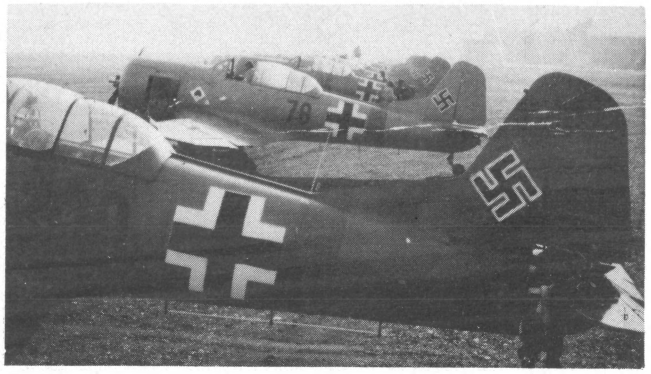

Yugoslav-produced Type 522 trainers masquerading as Luftwaffe *aircraft for a film*

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Yugoslavia's Type 522

Q: *Please identify the aircraft shown in the enclosed "stills".—Paul Wigley, London S.W.13.*

A: Presumably doubling as "Focke-Wulf Fw 190" fighter-bombers, these standard production tandem two-seat Type 522 piston-engine trainers are of Yugoslav origin and are finished in mock wartime *Luftwaffe* markings for a Yugoslav film.

Designed by a four-man team consisting of Engineers Šoštarić (better known for his transport glider designs), Dabinović, Durić, and Marjanović, the prototype (serial No. 60001) made its first flight in February 1955. Deliveries started two years later, being completed in 1960 after approximately 200 aircraft had been assembled. The Type 522 served as the standard JRV (Yugoslav Air Force) advanced trainer until being supplanted by the Soko Galeb jet trainer in 1966.

A few Type 522s were seconded to the State-run flying clubs in Yugoslavia. Most of these aircraft retained their military markings, although a handful were allotted civil registrations. The type was later used by the JRV as a station "hack".

The Type 522 was one of the first Yugoslav all-metal production aircraft. It had a two-spar, stressed-skin wing and an oval-section fuselage, the forward portion being of girder-type construction and the aft portion being a semi-monocoque.

For the gunnery training role the Type 522 carried two 7·9-mm. machine-guns, and for close-support duties underwing racks enabled four 55-lb. or 100-lb. bombs, or two 5-in. HVAR missiles to be carried. Powerplant was a 600-h.p. Pratt & Whitney R-1340-AN-1 Wasp, and dimensions were: span 36 ft. 1 in., length 30 ft. 2.25 in., weight 11 ft. 9 in., weight loaded 5,291 lb. Top speed was 218 m.p.h., cruising speed 178 m.p.h., service ceiling 22,966 ft. and range 607 miles.—*John Wegg, Yugoslav Aviation Specialist.*

Flanders B.2

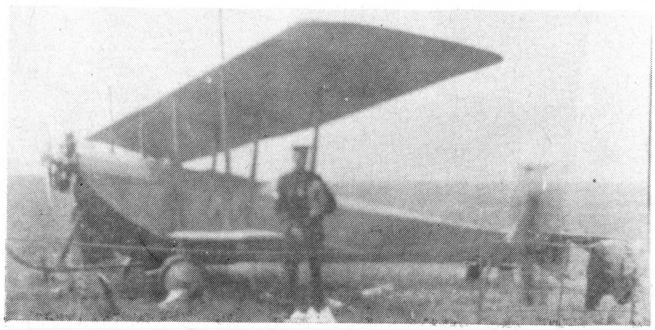
Q: *Please identify the aircraft in the enclosed photograph; it forced-landed at Little Wenlock, Shropshire, some time between 1917 and 1919. The policeman in the photograph is the grandfather of my colleague, Richard Hotchkiss, who confirms the date of the picture because it includes a black dog known to have been born in 1917!—Dr. C. P. Haigh, Southampton.*

A: The aircraft shown in Dr. Haigh's picture is undoubtedly the Flanders B.2, which was fully described in an article by J. M. Bruce in *Air Pictorial*, September 1961; but the date of the picture poses a problem. The B.2 was built by L. Howard-Flanders at Richmond in 1912 for participation in the War Office trials at Larkhill. It was powered by a 100-h.p. A.B.C. engine which was delivered only after the aeroplane had arrived at Larkhill, and which failed on the preliminary test run before the aircraft could be flown.

The B.2 returned to Brooklands where a 40-h.p. A.B.C. engine was fitted in December 1912, which was replaced during 1913 by a seven-cylinder 60-h.p. Isaacson radial engine. This in turn was replaced by a Gnôme rotary in mid-1914, and in this guise the B.2 was taken over by the Royal Naval Air Service at Great Yarmouth in August. According to all the evidence hitherto available, the Flanders B.2 expired there early in the war; so that Dr. Haigh's photograph, apparently showing it still flying three or four years later, is quite remarkable.

However, in spite of the pedigree of the Hotchkiss family dog, it is hardly possible to accept this late date. The engine shown in the picture appears to be the Isaacson radial which was returned to its makers before the outbreak of war, and is hardly likely to have been refitted by the R.N.A.S. The tail unit and undercarriage were both modified at about the same time as the Gnôme was fitted, but unfortunately the tail unit is blurred by the image of a moving figure on this photograph. The undercarriage is also not very clear, but seems to be the original pattern.

All in all, it seems more likely that the picture was taken in the latter part of 1913 or the early months of 1914. Another clue might have been provided by the airscrew, which was damaged in the forced-landing and was kept by the Hotchkiss family as a souvenir for some years, but this no longer exists.—*J. A. Bagley, Leader, British Civil Aviation Research Group.*



Dr. C. P. Haigh's photograph of the Flanders B.2 after its forced landing at Little Wenlock

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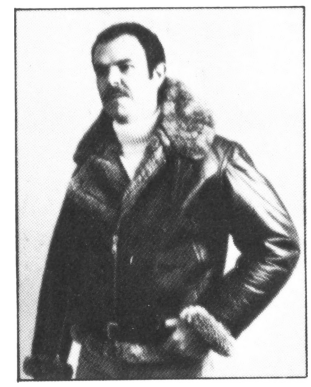

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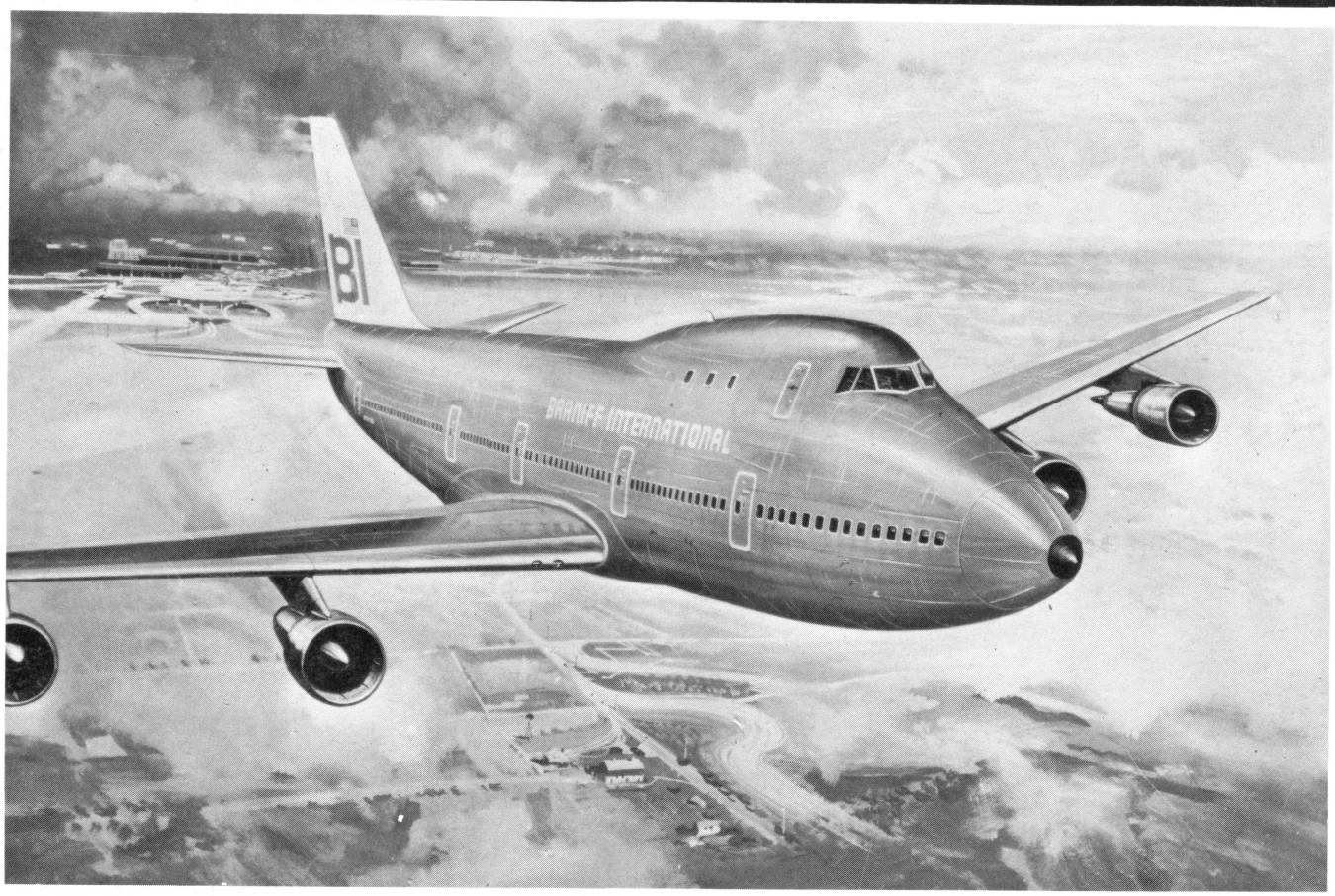

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